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ABSTRACT

This report of an international seminar which examined the utilization of advanced educational technology for the promotion of teacher education in the countries of the Asia and Pacific region is divided into six chapters: (1) an introduction providing background information, the purpose and themes of the seminar, and brief descriptions of the participants and seminar activities; (2) individual reports of activities in the countries represented at the seminar, i.e., Australia, India, the Republic of Korea, Malaysia, the Philippines, Thailand, and Japan; (3) a synthesis of the discussions of problems and issues common to the participating countries; (4) descriptions of study visits to Kyoto University of Education, the Kyoto Municipal Science Centre for Youth, the Ooizumi Campus of Tokyo Gakugei University, the National Institute of MultiMedia Education and the University of the Air, and the Library and the Center for Educational Technology in Tokyo Gakugei University; (5) a summary of the introductory talk by Yasutaka Shimizu, who provided a detailed overview of the use of advanced communication methods and education/training technology in Japan; and (6) recommendations formulated by the participants in the seminar for promoting the use of educational technology in teacher education in the Asia and Pacific region. Appended materials include the text of the greetings of the hosts, a schedule and agenda of the seminar events, a list of the participants, and a list of the members of the organizing committee. (EW)

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Asia and the Pacific Programme of
Educational Innovation for Development

FINAL REPORT
OF
THE FOURTH ASIAN SEMINAR ON EDUCATIONAL TECHNOLOGY
IN TOKYO

THE THIRD PROGRAMMING CYCLE OF APEID ACTIVITIES

10–19 October
1985

Japanese National Commission for UNESCO
Japan Council of Educational Technology Centres

The Fourth Asian Seminar on Educational Technology (Tokyo Seminar), Third Programming Cycle of APEID, was held at the Tokyo Gakugei University, Japan, from 10 to 19 October 1985. The Seminar was organized by the Japan Council of Educational Technology Centres, financed by Japanese Government and was based on the guidelines for the Third Cycle Activities of APEID, the Conclusions of the First Tokyo Seminar (October 1982) and those of the Second Tokyo Seminar (October 1983) and the Third Tokyo Seminar (September and October 1984) in line with the same cycle activities of APEID, and at the request of ACEID.

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Chapter I

INTRODUCTION

I. Background

1. The Fourth Asian Seminar on Educational Technology hereafter to be called the Fourth Tokyo Seminar was held based on the basic guidelines for the Third Cycle Activities of APEID (1982-1986), the conclusions of the First Tokyo Seminar (October 1982), the Second Tokyo Seminar (October 1983), and the Third Tokyo Seminar (September 1984).

2. The Third Tokyo Seminar was organized in collaboration with APEID, ROEAP, with the purpose of preparing the regional report on the development of computer sciences and technology in education which was submitted to Unesco HQ, Paris, as a contribution to International Symposium on the aforementioned theme which was expected to be held in Spring 1985. The report of Third Tokyo Seminar was sent under separate cover.

3. Taking into account of the output of Third Tokyo Seminar, the Fourth Tokyo Seminar was held on the more specific theme focussed on the utilization of advanced technology for promoting teacher education.

II. Purpose and Themes of the Seminar

Purpose : The purpose of the Fourth Tokyo Seminar is to contribute, through the exchange of information and experiences regarding the utilization of advanced technologies promoting the teacher education, to synthesize them and to the development of national capacities for the improvement of teacher education utilizing innovative educational technology.

Theme 1 : To exchange information and experience, and consider significant cases in the development of teacher education with an emphasis on the utilization of advanced technologies including microcomputers, and develop appropriate strategies in order to meet the needs in respective participating country.

2 : To examine the roles of educational technology, especially the utilization of advanced technologies which will promote teacher education in the Asian and the Pacific Region.

III. Participation

Seven countries;namely Australia, India,Republic of Korea, Malaysia, Philippines, Thailand and Japan were represented at the seminar. In addition, the seminar brought together 15 specialists from various Japanese institutes and one from Thailand.

IV. Inaugulation

At theoutset of the seminar, Mr. Akiyuki Tahara, Director of UNESCO and International Affairs Department, made a speech to extend a hearty welcome to all the participants and emphasise the importance of cooperation between the participating countries in the field of education. Following his speech, Mr. Haruo Nishinosono, Chaiman of the Japan Council of Educational Technology Centres, made welcome speech both refering to the significance of the present seminar. (For the greetings, see Appendix(1).)

V. Election of Officials of the Seminar

The opening ceremony followed by the election of officials of the seminar: The participants elected Mr. A. K. Jalaluddin from India as the Chairperson, Mr. Wayne Ransley from Australia and Mr. Haruo Nishinosono from Japan as Vice-Chairpersons, and Mr. Nilo L. Rosas from the Philippines and Mr. Ken Kanatani from Japan as Rapporteurs.

These officials of the seminar and members of the Organizing Committee formed a Steering Committee. (For the list of the Organizing Committee, see Appendix(4).)

VI. Schedule and Agenda

According to the schedule and agenda adopted by the participants, the seminar included such activities as presentation of country reports and discussion on them; study visits and workshops at Kyoto University of Education and Kyoto Municipal Science Centre for Youth; study visits to Ooizumi Elementary School attached to Tokyo Gakugei University, the National Institute of Multimedia Education, the University of the Air and Tokyo Gakugei University; a lecture by Prof. Yasutaka Shimizu of Tokyo Institute of Technology; demonstrations by Prof. Yoshikazu Murakami of Ehime University and Prof. Masanao Kitamura of Hokkaido University. (For the schedule and agenda, see Appendix(2).)

Chapter II. Summaries of Country Reports

1.AUSTRALIA

Background for Teacher Education and Technology

In Australia, "teacher education" is increasingly being seen as a process of continuing development throughout the professional career of a teacher. This is reflected in the emphasis given to the "in-service" sector of training in the educational use of computer and related technologies. A high proportion of training is taking place outside the traditional institutions.

Any analysis of Australian education must be carried out within a complex organisational framework. It must be kept in mind that Australia does not have a national education system ; there are eight separate authorities to determine policies in the government sector (six States and two Territories) leaving non-government schools throughout the country with the power to determine their own directions. Educational responses to developing technologies by ten various authorities are as varied as those between countries in other places. An analysis of teacher education is further complicated because of the number and variety of agencies and institutions involved. There is no coordinated policy across or even within institutions ; each tending to "go it alone". Often individual departments within institutions respond to local need as they think best. The offerings for both pre-service and in-service are so varied that it is difficult to discern any generalisable emerging patterns.

While the Commonwealth government exercises no directcontrol in management strategies and policies it nevertheless exerts influence through the School Commission. Details of its National Advisory Committee on Computers in Schools (NACCS) were given in the report for the Third Asian Seminar. Subsequent action by the Commonwealth Government led to the adoption of a National Computer Education Program. Funds are distributed through Computer Education Coordinating Committees, in each state there is one for government and one for non-government schools. This initiative seems to have been motivated by a desire to promote a co-ordinated national effort. In particular they wished to ensure that all schools should have "appropriately trained staff" (NACCS, 1983).

Other nationwide organisations are also concerned with the issues surrounding teacher education in the newer technologies. The Australian Education Council (AEC)has appointed a task force to report on Education and Technology in Australia. It is concerned with the promotion of teacher development in the area of technology. As well,it is exploring the potential of new technologies to promote teacher education, particularly distance training of teachers. The Commonwealth Tertiary Education Commission (CTEC) recently suggested that consideration be given to increasing access to tertiary education using new communication technologies (CTEC Report, 1985).

A considerable range of research and development is being carried out into all aspects of new information technologies and education. A great variety of work is being done in the use of new technologies to teach technical and scientific courses in the tertiary sector. However there is little evidence of systematic research in the specific topic of technology and teacher education.

Technological Training of Teachers

Traditionally, teacher education courses have included a study of technology as a small component in "media" studies. However changes to courses have mushroomed during the past year, so that by the beginning of 1986 a high proportion of institutions will have compulsory components in computer related technologies.

A few student teachers include components of computer/information sciences as part of their courses. These students usually intend to work in secondary schools as computer studies and/or mathematics teachers. However, many are attracted to other professions during their training.

Many short and long term courses for the professional development of teachers are provided by in-service or curriculum sections of government departments of education. Increasingly computer education options are being provided by central educational computing facilities (e.g. Elizabeth Computer Centre, in Tasmania). By 1986 such centres will exist in most major regions of the Country.

Computers and Teacher Education

Muchof the difficulty in describing the current position in Australia stems from a confusion of terminology; courses with identical names in different partsof the country can have quite different content. As new educational uses for computer related technologies are found, more distinctions in terminology are needed. The variety of uses are reflected in the variety of aims for teacher education. A contemporary list in Australia would include the following : training to teach about computers ; to teach programming ; to teach computer literacy (including social implications) ; to teach the "across the curriculum" or "intellectual tool" use of computers (word processing, spreadsheets, database applications, writing planners, electronic mail, voice and data links, satellite links ; some argue for Logo in this category) ; to teach computer based learning use of computers, both as an aid as sole source of instruction (drill and practice, simulation and gaming, interactive instruction, AI applications as they become available).

Differences in course content tend to reflect both differing conceptions of the educational use of computers and consideration of different target groups. Earlier courses tended to emphasise teaching about computers and programming (notably in Basic). Most recent courses have tended to underplay the computer science aspects and concentrate on the "across the curriculum" and "teaching with computers" use of computer related technology. For example from the beginning of 1985, the Centre for Education at the University of Tasmania has offered a Graduate Diploma of Educational Studies (Computers in Education). The course is targeted at professionals who wish to specialise in the use of computers in their area of education, or act as resource persons in the educational use of computers. The course is equivalent to one year of full-time study and is offered on a part-time basis.

Despite recent initiatives, it is widely accepted that the professional development needs of teachers are not being met. According to a recent report (Fitzgerald, Hattie & Hughes ; 1985) it is felt that teachers with specialist qualifications are needed to serve as resource teachers in school systems.

A growing number of people feel that courses in straight computer/information science are not the best training for the educational use of computers in classrooms. For example it is argued, that a teacher with a major in computer science is not the best person to advise a fourth grade teacher about "process writing" with computers. It is felt that most of the content in computer science is irrelevant for the majority of future teachers and that special courses are needed which specifically make connections between education and technology. There is a growing need for specialists who have made a specific study of the educational uses of computer technologies.

Most institutions have made more comprehensive responses to inservice needs than pre-service ones. Classroom teachers are immediately affected by societal pressures demanding more computer education for children. Therefore institutions tend to see present teachers as making stronger claims for assistance. New thinking can be injected into teaching quickly with relatively short, flexible, and intensive in-service courses. There are other reasons for this pattern, which have more to do with funding and staffing resources in the institutions.

Teacher education departments in Australian tertiary institutions are operating in a state of non-expansion ; in some cases they are not permitted to replace staff who leave. The period requiring increased expenditure for technological education has coincided with a decline in funding. A commitment to provide the necessary hardware and software places impossible demands on the budgets of teacher education institutions.

Problems associated with staffing new courses are even more critical than those with providing the technical resources. The proportion of people with the appropriate qualifications, skills, and knowledge is very small. Many institutions have not been able to employ new staff to teach the courses and have had to use part-time people or staff seconded from state departments (e.g. Tasmanian State Institute of

Technology). In a few cases institutions have contracted outside people to write courses which are taught by existing staff. In some institutions, staff have been able to make lateral moves within and between departments ; this may still leave the problem of covering the teaching of their original workload. Almost every institution is involved in some way, with retraining existing staff to teach the new content. Technological developments are occuring at such a rate and on so many fronts, that severe problems are faced in ensuring competent delivery of new courses. There is a growing feeling among educators at all levels, that adequate provision is impossible under present circumstances. Radical changes may be needed such as large injection of funds, a commitment to increase staff numbers in the area and joint teaching by Education and Computer Science departments in the same institution.

A more pressing problem than how to train the trainers, is providing for the majority of preservice teachers. What direction should one take in the face of rapiddevelopments and changing conceptions ? How can a new area be added to an already overcrowded syllabus ? Some educators argue for the introduction of new units which focus on computer literacy and educational computing. Others argue that specialists ought to work with curriculum lecturers to change existing units to take account of computer related developments. After time the computer specialist would withdraw. The latter has the advantage of helping the students see and use the technology in the natural subject setting. Perhaps compromises will prevail using elements of both approaches.

Many see the problems of training teachers in the new technologies as potentially beyond the human resources of teacher institutions. It is argued that the solutions rely on the use of the new technologies themselves. Courses need to be written which require less recurring input from lectures and rely more on computer based materials.

Technology to promote Teacher Education

Microteaching remains the most common use of technology for teacher training, but has lost the widespread appeal it had in the early 1970's.

A few institutions have begun to experiment with computer based technologies to teach off-campus courses. In Queensland, remote students can visit special study centres to use audio teleconference and electronic mail links. Plans are underway to use AUSSAT for in-service through voice, video and data links. Gippsland CAE has planned to deliver computer education course material with the aid of a variety of technologies, including portable computer disks and electronic information services. In Tasmania the UCE has been exploring some possibilities of advanced technologies to help promote teacher education. In 1983, experiments were carried out into the use of interactive television for remote teaching (Collis and Caldwell, 1984). The results were very successful but used relatively high-cost technology. Cheaper proposals for the use of the "Orator" two way communication system have been made within the University. This system enables two way voice communication to be made between groups using existing telephone links. The plan is to augment its use with "Viatel" terminals. For remote teaching, Orator could provide the audio link with Viatel providing a fully interactive electronic blackboard.

Australian trials have demonstrated the benefits of many new methods of communication. In general, recognition is given to the educational potential of technologies such as two-way voice, dialog and data base systems, interactive television and interactive video. At present, in teacher education there is little definite commitment to this technology. Of course, in examining each of these possibilities questions concerning funding have to be considered. Who is to pay ? Is it worth the expense ? What will it actually cost when the use becomes continual ?

Increasing part-time enrolments may forcetertiary institutions into decision making in the near future.

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2. INDIA

Induction of Advanced Technology in Teacher Education and Training

Since The Third Seminar on Educational Technology held in Tokyo in Sep-Oct 1984, several important developments have taken place in India for widening and strengthening the infrastructure of advanced communication and educational technology with emphasis on the training and active participation of teachers at different levels of education.

The Communication Network

In a record period of nearly one year, the national television network, Doordarsan, has been able to install nearly 100 low and medium power transmitters to relay television programmes all over the country. More than 70% of the total population of 700 million are now covered under the network. This network is used one hour for transmission of educational enrichment programmes for the tertiary sector with another hour of repeat transmission every day. This is in addition to the educational programmes for children and the local community beamed to six states in the country with the help of the national satellite INSAT-IB. The Central Institute of Educational Technology (CIET) of NCERT is responsible for production of programmes for primary school children and training of personnel nominated by the six INSAT covered State and for the setting up of the State Institute of Educational Technology (SIET). The CIET and SIET production teams have developed institutional arrangements with experienced school teachers and teacher educators for the identification, testing and of utilization of educational TV and video programmes, both in the school setting and also through community viewing facilities in the rural areas. However, no large scale orientation and training programmes have yet been organised for the benefit of classroom teachers.

Infrastructure for Training of Educational Media Personnel

The University Grants Commission has set up two Communication and Media Research Centres, one at Jamia Milia Islamia in Delhi and the other at Poona University for conducting post-graduate diploma courses and research and development activities in educational technology. In fact, these two centres have provided the tertiary level educational TV major back up support programmes under the UGC scheme. A significant number of University faculty have played an active part for the preparation and presentation of these programmes. Large number of letters received by the UGC and NCERT from the viewers of the educational programmes are indicative of the growing popularity of educational TV and video programmes. Three other universities in the country are in the process of setting up similar research, training and production facilities under UGC funding.

NCERT has recently finalised a plan for equipping its Four Regional Colleges of Education, located at Mysore, Bhubaneshwar, Bhopal and Ajmer as the regional centres of educational technology for organising advanced level teacher education courses as part of their four-year integrated undergraduate programmes and also special short cycle in-service programmes.

Constraints and prospects

Preparation and use of audio-visual aids, in fact happens to be an important component of undergraduate and post-graduate teacher education programmes in several universities. However, the present trend is to include more in-depth courses with emphasis on preparation, utilization and evaluation of multi-media packages, including TV and video programmes. While expanding the infrastructural facilities in the field of educational technology and restructuring the teacher education courses, the educational authorites are aware of several major constraints in the effective implementation of educational technology programmes using sophisticated equipment. These are non-availability of adequate funds to provide colour TV and DRS (Direct Reception Sets for INSAT-IB programmes) microcomputers and peripherals, absence of an efficient network of maintenance services, and lack of an adequate number of educationally oriented software designers, producers and researchers. The multiplicity of languages in which the educational media programmes are required to be produced and the diversity of the composite culture that is to be reflected in these programmes adds further constraints on the production side. However, it is now being increasingly realised in India that some of these constraints can be actually overcome by inducting advanced technologies for the purpose of the quality of improving production, dubbing and animation, including, the computer based ones. Advanced technology also offers greater opportunity of optimally using resources by interfacing and networking different media and existing comunication systems.

Tele-conferencing and two-way utilization of transmission facilities through the Indian National Satellite systems and ulitilization of additional satellite transponders for transmission of educational TV programmes simultaneously in more than one language and transmission of teletexs are some distinct possibilities in the educational technology scene in India today in view of the priority attached by the government in this area for the improvement of the quality of education in the context of the proposed New Education Policy. The Indira Gandhi National Open University recently established by an Act of the parliment will go a long way in promoting multi-media education in India.

More detailed analysis of the perspective of educational technology is given in the document published by the Ministry of Human Resource Development, Government of India under the title, "Challenge of Education-APolicy Perspective."

Preparation of Teachers for Computer Education

The computer Literacy and Studies in Schools (CLASS) project launched in 1984 in 250 higher secondary schools has been expanded to cover additional 500 secondary and higher secondary schools in 1985. In addition to 750 teachers trained in 17 Resource Centres in 1984, 800 more teachers have been trained in June-July 1985 in 40 Resource Centres. The total number of Resource Centres identified under the project has reached the figure of 50. Out of these 50 Resource Centres, only 4 (two under NCERT and another two under the Technical Teachers Training Institutes) are located in the traditional teacher education institutes. The rest of the Resource Centres are located in the Computer Science Departments of Indian Institutes of Technology, Colleges of Engineering and Universities. These Resource Centres have joined the computer literacy project out of their institutional interest and social commitment. Their involvement in the teacher training programme may not continue for more than another two or three years. It has therefore been decided by the government to increasingly involve the well-established teacher education colleges and the education faculty of the Universities in the institutionalisation of the in-service programmes of school teachers in computer education. The present strategy is to associate the member of the education faculty as observers and resource persons in the teacher training programmes in the existing Resource Centres. The education colleges and departments are being equipped with hardware facilities as a follow up of their participation as guest faculty in the neighbouring Resource Centres.

The teacher training programmes have initialy been designed as modular units with greater emphasis on the use of generic and cross curricular packages like word-processor, database, spreadsheet and graphics. Computer based learning packeges, being limited in number, are used in the training programmes mainly as demonstration of curriculum linked applications. The three-week initial training programme also include independent teacher projects in order to give the teacher a sense of confidence and also as a source of motivation. However, by and large, it is now felt that the initial training of three-weeks duration is inadequate from the point of view of raising the competency of the teacher to the level when he could continue to learn on his own.

New Areas of Training for Human Resource Development

With the growing prospect of introducing authoring systems under the CLASS project, the need for supplementing the exsiting initial training programmes of teachers with well designed modules for courseware writing and models for using computer-based learning packages both for individual learners and large groups of students have become almost imperative. Specific efforts are being made to identify appropriate educational ideas across the curriculum for development of educational computer software through a consortium of Resource Centres and commercial software houses under appropriate contractual, copyright, warranty and maintenance arrangements supervised by NCERT. An advanced level training programme of 10 weeks' duration for educational resource personnel in software development has been concluded recently. Similar programmes are being planned for fresh groups of teachers and other educational personnel, including curriculum developers and specialists whose services are being utilized for the preparation of the documentation in support of the indegeneously produced software and also for the preparation of other course materials and video programmes in support of the computer literacy project.

It has been decided by the Ministry of Human Resource Development that the computer literacy course should continue to be based on voluntary participation of students and that the course should be introduced at the eighth grade instead of the present policy of introducing it at the eleventh grade. In view of this change in the entry point of the computer literacy course there is a possibility that the existing hardwarefacilities may be extended in order to introduce computer-based vocational courses with focus on information technology and microcomputer application in services at the eleventh grade. Appropriate pre-service and in-service teacher education courses are at present under consideration of NCERT and Boards of Secondary and Higher Secondary Education. Documents regarding these new programmes are expected to be published soon after they are approved by the concerned authoritis.

One of the major areas of concern in the field of teacher preparation for computer education in schools is the possibility of the products of the pre-service programmes leaving their teaching position in view of the higher market value of the training they are likely to receive under the computer education programme. The policy on teacher education in this area is therefore likely to shift in favour of concurrent short cycle in-service programmes for those teachers who have already developed an interest in remaining inthe schoolsystem.

3. THE REPUBLIC OF KOREA

1. Introduction

(1) System of Teacher Education in Korea

Current systems of inservice teacher education in Korea are consisted of center-based education, school-based education and individual-based education. The types of center-based education are two. The one type education is executed by Ministry of Education according to it's plans, and the other type education is executed by Province Committees of Education according to their plans. The school-based teacher training is done by teachers themselves in school and is consisted of each-other discussions and seminars on their major teaching subjects. The individual-based teacher education is achieved with entering college and graduate school or personal research of their teaching subjects.

(2) Policy Changes of Educational Technology

As the importance of educational technology in education has been emphasized, the policies of educational technology in Korea have been changed. Since the early 1960's the utilization of educational technology have been expanded from applying the simple audio-visual aids in classroom to applying the VTR, VCR, educational TV and radio, and microcomputer in classroom.

The policy of educational technology in teacher education and training has been changed in keeping pace with the promotion of availability in teacher education and training, however, is not sufficient till now because many of policy-makers and educators in Korea are not active nor energetic in using the educational technology.

In spite of that, the policy will more and more enlarge and emphasize the utilization of educational technology in all educational fields.

(3)The Example of Inservice Teacher Training for Personal Computer use

The purposes of education of personal computer are to have teachers learn skills and techniques of using computer for their jobs and learn basic knowledge of operating the programs of computer aided instruction or computer based education.

The contents of teacher training of personal computer are consisted of history and basic knowledge of computer, programming technics, procedures and formats of using hardware like as tape driver and disk driver, and file creation and management.

2. Trends and Issues on the Utilization of Advanced Technology in Teacher Education

(1) Utilization of Educational Broadcasting in Teacher Training

The Educational Television was launched in 1972 as a part of KEDI's function. Most of Programs being for the pupils and students, however, KEDI develops the programmes for teachers, and put those on the air in "Teacher's Hour". The objectives of Teacher's Hour are the improving teachers' abilities through giving them the courses of teacher training.

The programmes are broadcasted one section per week through TV and radio. The major contents of the programmes are consisted of the improvement of instructional method, presentation of examples of new material and instructional method.

These programmes are widely used by teachers for improving their instructions.

(2)Teacher Education and Training via Air and Correspondence College

In Korea many teachers have been enrolled in colleges, universities, and graduate schools for various purposes. A number of teachers, especially elementary school teachers, have been registered in Air and Correspondence College.

At 1984 the number of Air and Correspondence College students whose occupation are teacher is about thirty thousands, and two-thirds of them serve in a position of school.

This means that Air and Correspondence College contributes to teacher training even though the major function of Air and Correspondence College is not teacher training.

(3) The roles of Educational Technology in Teacher Training in Korea

Now the roles of educational technology in teacher training and education becoming more important, but the use of educational technology in teacher training and education is not satisfying yet.

This is, the use of computers in all kinds of training and education is in infant stage. Other instructional media, for examples Video Tape Recorder, Video Cassette Recorder, Educational Broadcasting etc., are used relatively well in teacher training and education. The opinions of trainees are that the use of educational technology in teacher training is needed to be expanded.

3. Current Activities of the Related Institutions

(1) Trends in Teacher Education and Educational Technology

Recently, almost people who have relation with education relatively well recognize that the courses of educational technology should be taken in teacher college and in teacher training programmes.

The major activities in Korea in the 1980's are following :

One : many universities had established and are planning to establish the department of educational technology or the center which is designed to utilize educational technology in teacher education and training.

Two : the educational technology courses are included in all teacher education and training programmes. In teacher college all students should take the courses of educational technology as a part of eight common courses (2 credits)

(2) Perspectives in Teacher Training and Educational Technology

The application of educational technology will be increased in teacher training. Several Universities are going to establish the teacher training center designed to utilize the educational technology. And the utilization of Educational Broadcasting in teacher training will be also increased because teacher's need of enlarging the programmes for their training should be fulfilled. In teacher training programmes for obtaining first grade teacher certificate, all trainees should take the educational technology courses.

(3) KSET

KSET (The Korean Society for The Study of Educational Technology) was organized at April 4, 1985. The roles of KSET are shown as follows :

(1) Researching : KSET will perform the study on educational technology and review literatures of educational technology for enlarging and filing the knowledges of educational technology and related realms.
(2) Linking : In order to lessen the gap between the field and theory KSET will perform the field studies.
(3) Consulting : KSET will establish the Communication Network of information between the producers and the needed.
(4) Innovating and Reforming : KSET will contribute to innovating and reformingthe education byusing educational technology.

(4) KEDI's Research and Development

One of KEDI's research activities is the research and development of Computer-Aided Instruction program. In 1985 we have studied the model of CAI program which will fit the situation of Korea, and in accordance with the model we are developing the CAI programmes of science subjects of elementary school curricula and mathematics of secondary school curricula. Next year we apply these programs to instruction in classroom and test the effects.

These CAI programmes willbe brought fair change in using educational technology in education.

4. Conclusions

Utilization of advanced technology in teacher training and education should be enlarged not only for improving educational efficiency and opportunity but also for coping with the future changes of educational environments. For these purposes it is very important in Korea that schools, research institutions, ministries, and industries are closely related with each other.

4. Malaysia

UTILISATION OF ADVANCED TECHNOLOGY IN TEACHER EDUCATION

1. Introduction

Teacher education in Malaysia is organised at two levels:

(a) Diploma in Education -- this course, available in five of the six local universities, can either be taken concurrently with an undergraduate degree or consecutively for a period of one year after completing the degree. Teachers thus trained, known as graduate teachers, are normally assigned to teach the upper classes in Malaysian secondary schools. These programmes are organised by the respective universities through their departments/faculties of education. Each department/faculty is headed by a dean who is answerable to the university senate in the formulation and organisation of training programmes within his faculty. As there is considerable autonomy within each university in the kind of programmes it offers, the courses of studies for the diploma in education programme tend to differ from one university to another.

(b) Certificate in Education - this is a three-year programme for secondary school leaders who apply to become teachers and is offered in 27 teachers' colleges throughout the country. Those graduating from these institutions are known as college-trained teachers and are normally placed in the primary schools or the lower classes of the secondary schools. The teachers' colleges come under the direct control of the Teacher Education Division of the Ministry of Education (TED). TED is one of several professional divisions in the Ministry and is responsible for various aspects of pre-service and in-service teacher education programmes in the colleges including student selection, courses of studies, examinations, certification, staffing and planning and development.

2. Educational Technology In The Teacher Education Programms

(A) Pre-Service

Educational Technology Departments or Units have been established in all universities and teachers' colleges. Generally, they perform teaching functions, but in institutions where there is adequate support staff, they also provide services and, in some cases, even conduct in-house training for other departments or faculties.

Educational Technology as a course is taught under various names in the universities. The course content and areas of emphases and time allocation also vary from one university to another. In three universities, the course is compulsory, while in the other two it is offered as electives. In the teachers' colleges, the course is called Instructional Systems Technology; it is centrally-prescribed by TED and is compulsory for all student teachers.

In most courses, the stress is on the development, production, organisation and utilisation of instructional materials usually found in Malaysian schools. Students, therefore, would be introduced to, and acquire skills in the utilisation of various instructional hardware and the production of resources like graphs, charts, mimeographed materials, maps, posters, writing boards, OHP transparencies, photographs and photographic slides, 3-D materials, audio and video materials (including the utilisation of EducationalRadio and ETV programmes). In the teachers' colleges, students are also required to acquire basic skills in classification and cataloguing of materials (book and non-book) and the organisation and management of school resource centres.

In all institutions, some aspects of educational technology would also be covered in specific subject pedagogy courses.

Educational Technology Departments in the universities and teachers' colleges are fairly well-equipped with the usual educational hardware and software necessary for carrying out their respective programmes. Teachers' colleges have also been equipped with mini studios (with CCTV facility) and language laboratories. The former is used quite extensively for microteaching in pedagogy courses and for video recording and playback of specific educational programmes and the latter is used for Bahasa Malaysia (the national language) and English language courses. The degree of utilisation of language laboratories varies from college to college, the problem being the difficulty of acquiring suitable software for the Malaysian context.

(B) In-Service

The longest on-going programme is the one-year specialist course in Educational Technology (formerly known as 'audio-visual education') offered at the Specialist Teachers' Training Institute (one of the colleges under the TED) since the early 60's. Under this programme, between 20 and 30 teachers with a minimum of five years' teaching experience are selected yearly to undergo a more in-depth programme on various aspects of educational technology. The programme also offers a number of elective courses on areas like film animation, script writing, educational innovation and other aspects of audio and video production which have not been covered in preservice programmes. For carrying out such elective courses, the Institute seeks the help of the Educational Media Service of the Ministry of Education which is responsible for the provision of educational radio and ETV programmes for Malaysian schools.

The Universiti Sains Malaysia in Penang has also mounted two similar in-service programmes in Educational Technology for serving graduate and non-graduate teachers. One is at the Diploma level while the other is called the Certificate Course in Education Technology.

At another level, training programmes are offered by the Ministry of Education through its Staff Training Scheme. Since the inception of the scheme in the early'70s, many teacher educators and administrative personnel in the Ministry have been awarded bursaries and scholarships to pursue degree and post-graduate courses in Educational Technology overseas, mainly in Britain and the United States. The programme has helped to give the much-needed impetus to the development of educational technology at the tertiary level and increase the number of local expertise in the field. Many university lecturers have also benefitted from similar training programmes offered by their respective institutions under bilateral arrangements with the Government's Public Services Department.

Apart from the programmes mentioned above, a number of other short-term training programmes, courses, seminars and workshops have also been carried out by individual institutions and professional divisions of the Ministry of Education. Such training programmes are usually funded by the Ministry through a yearly grant to a special In-service Education Committee. This Committee is headed by the Director General of Education or his Deputy and it coordinates all in-service teacher education programmes organised by the various agencies within the Ministry. The Training and Staff Development Unit of TED acts as the Secretariat for this Committee.

3. Computer Education In The Teacher Education Programme

At the moment, all universities and a few teachers' colleges already have computers, but these are used mainly for administrative purposes. In two universities, however, aspects of 'Computer in Education' have already been included in the teacher education programme. In one teachers' college -- the Technical Teachers' College -- computer education is offered to students who follow Commercial courses, using mainly word processing programmes.

Apart from these, computer education as a separate course or as a component part of existing educational technology courses does not exist as yet in any of the teachers' colleges. One reason which can be attributed to this is that, computer education, as a subject, has not been formally introduced yet into Malaysian schools. Teacher education institutions tend to view their role as service agencies for the schools and thus concentrate only on course areas or components which are of immediate need to the teachers when they embark on their teaching careers.

Another reason is lack of time. Students in teacher education institutions are required to follow so many prerequisite courses that the total time available in the teacher education programme has to be spread rather thinly over all subject areas or course components.

Teacher education institutions, however, are aware of the need to introduce student teachers to computer education. Under the Fifth National Plan for Education, the TED has requested for funds to be allocated to all teachers' colleges for the purchase of computers. These are intended to be used not only for administrative and organisational purposes but also for specific educational activities like self-study, CAI and also for mounting special courses to heighten computer awareness and promote computer literacy among student teachers and also teacher educators.

TED is optimistic that its request for additional funds to equip colleges with computers will be favourably considered. This is because of the recent announcement by the Minister for Education that computer education will be formally introduced in Malaysian schools in 1986, initially for secondary forms IV and V pupils. If schools are to benefit from this move, then it is imperative that teachers graduating from teacher education institutions be equipped with the knowledge and necessary skills in the field. It is evident that even among teacher educators, computer literacy and computer awareness is still low and should be a matter of concern for educational administrators.

At the school level, the Ministry's move over the last few years has been to encourage the formation of computer clubs. A recent survey has shown that today about 80 schools have already done so, and the number is steadily growing. This augures well for the future and will soon bring the day when computer education and the use of computers in education become a reality in Malaysian schools.

4. Technology in Promoting Teacher Education

A recent study conducted by TED revealed that lecturers in teachers' colleges generally still adopt the traditional lecture as their main teaching strategy. In current programmes carried out by TED, therefore, the emphasis has been on encouraging teacher educators to adopt other strategies so as to reduce contact hours between lecturers and students.

As mentioned earlier, microteaching is widely used in most institutions, especially after short-term courses and seminars have been held for the benefit of education and other subject lecturers. TED has also embarked on a programme on the production of self-instructional modules for use by student teachers. Initially, the project has produced modules in the national language on some areas in Educational

Psychology and Sociology. It is hoped to extend this activity soon to other areas of the teacher education curriculum. Another project worth mentioning is the production of video programmes jointly carried out by TED and the Ministry's Educational Media Service (EMS). Under this scheme, the textual scripts for specific programmes are prepared by teacher educators in the colleges and they are then passed on to the producers in the EMS who would produce the programmes for the benefit of students.

TED has also just started an on-going programme aimed at promoting the use of technology among teacher educators in the colleges. Primarily, the programme is intended to benefit lecturers not from the Educational Technology Department and to enable them to acquire basic skills in the use of technological hardware and the production of related software. Eventually, it is hoped to set up a central production and distribution centre of related software to service all the teachers' colleges. The programme would also focus on activities aimed at heightening computer awareness and increasing computer literacy among teacher educators so that they can play effective roles as managers of learning in the not-too-distant future.

5. PHILIPPINES

I. Background of Teacher Education and Educational Technology

Teacher education in the Philippines has evolved through the interplay of a variety of influences. Since 1868 when the first normal school for men and the first normal school for women were established till the present, reforms in teacher education have gone on, with a continuing search for new orientation to make it more relevant to the needs of national development.

During the '70s and early part of the '80s, the need to relate teacher education programs to the needs and demands in education gained prominence. This has given rise to the issue of what alternative models teacher education programs will prepare teachers who can cope with the needs and demands of a modernizing Philippine society. In view of this issue, various curriculum innovations in teacher education have been tried out or advocated, among which are the one-stream curriculum, the competency-based curriculum, the practicum-based curriculum, ladder-type curriculum and the Integrated Teacher Education Program.

The different curricula leading to baccalaureate degrees that are presently being offered in various teacher education institutions numbering 497 spread all over the Philippines include the following :

1. Bachelor of Elementary Education (BEEd)for elementary school teachers
2. Bachelorof Secondary Education (BSE)for secondary school teachers
3. Bachelor of Science in Agricultural Education (BSAE) for teachers of agriculture
4. Bachelor of Science in Industrial Education (BSIE) for teachers of industrial / vocational subjects

5. Bachelor of Science in Business Education (BSBE) for teachers of business subjects

In terms of governance and ownership, teacher education programs are offered in state colleges and universities (some are chartered and some are MECS supervised), private colleges and universities which are sectarian and private colleges and universities which are non-sectarian.

TheMinistry of Education,Culture and Sports (MECS) Order No.26, series 1983 known as Policies and Standards for Teacher Education synthesizes the mission statement of teacher education as "the preparation of teachers imbued with the ideals, aspirations and traditions of Philippine life and culture and sufficiently equipped with knowledge of an effective delivery system."

Parallel with the development of teacher education is the growth of the educational media program in the Philippine educational system. At least in every higher education institution which offers teacher education, there is an audio-visual program. At the local level some learningresource centers / educational media centers have beenput up in some school divisions (provinces),school districts (municipalities) and institutional units. Except for the big schools which are mostly private and located in the urban centers, the facilities and instructional materials which the teachers use are rather limited. They include some of the basic audio-visual equipment and a very limited number of sound film, filmstrips, recordings and other print and non-print audio-visual materials. An increasing number of schools, particularly those administered by religious organizations have purchased various types of projectors, VTR system and computers for instructional purposes.

A new policy on the use of computers in education has been enunciated by the new minister of Education, Culture and Sports. In 1984, he underscored as one of his priorities an "assessment of the requirements for increased emphasis on computer education and new technologies as means for preparing for the future."

An ad-hoc Cabinet Sub-Committee on Computers was created by Letter of Instruction 1381 to review the role and potentials of computers in the development of the economy. A working technical committee on "Human Resources Development for Information Technology" was organized and has come up with a set of policy recommendation and plans of action relative to the introduction and use of computers in education including pre-service and in-service teacher education.

II. Educational Technology Programs in Teacher Education

Training in educational technology are provided in both the pre-service and inservice teacher education.

At the preservice level, the present Bachelor of Elementary Education and the Bachelor of Secondary Education curricula have both one subject entitled "Principles of Teaching and Educational Technology (including Basic Computer)." This is a course which utilizes a systematic approach to teaching and learning through instructional technology. The course casts the traditional notions of Audio-Visual education its emphasis on the acquisition of media knowledge substantiated by visual literacy multi-media applications, computerization, simulation and educational games. The course as a whole aims to make prospective teachers aware of the wide range of communication alternatives other than the teachers themselves and the printed medium. It also aims to provide the students with the opportunity to select and use appropriate print and non-print materials and acquire skills in utilizing them to communicate ideas effectively in order to facilitate learning and teaching. This subject is required of all teacher education students.

In other teacher education institutions, an elective subject in educational media is offered. It is a basic course on the principles of selection, preparation, utilization and evaluation of audio-visual materials.

In the undergraduate program for teacher education (both BEEd and BSE), Educational Media/Technology continues to be offered as an area of concentration, as a major or as a minor. Subjects in the undergraduate curriculum include the following : Basic Theory of AV Education, Principles of AV Materials, Organization of AV Materials, Curriculum Integration of AV Materials, Production Techniques, Administration of AV Programs, among others.

At the graduate level, courses in Audio-Visual Education are being offered in a number of graduate schools either as part of the professional courses component or as an elective or as a cognate. Effective April 1971, the field of specialization in AV education under the revised curriculum for the MA in Education degree has been expanded to the broader field of educational-media which includes audio-visual,radio and television education. To complete the field of specialization in Educational Media, the following course requirements under the graduate program for teacher education are being offered : Seminar in Educational Media, Educational Media Systems, Educational Media Production 1,2,3 and 4, Organization and Administration of Educational Media Programs, and Seminar in Educational Media Research. Nomenclatures of course titles vary from school to school. With the new developments in technology particularlythe hardware, courses on the utilization of various types of projectors, VTR, and computers, etc. have also been included in the curriculum.

Other forms of in-service training other than attendance in courses at the graduate or certificate of proficiency levels are also being undertaken singly or collaboratively by the academe, the MECS, professional organizations, government agencies such as the Office of Media Affairs, Technology Resource Center and the Ministry of Human Settlements, among others. They are offered in seminar-workshop type of short-term courses, of short duration and with very specific and concrete objectives.

The trend lately in the use ofeducational technology in the Philippines has been on the development of low-cost and locally prepared educational aids from indigenous raw materials. This trend is a recognition of the fact that teaching and learning situation need more humanized and personalized teaching-learning strategies especially in the under-privileged, underserved, depressed areas and also in the Decentralized Learning Resource Centers.

III. Computers in Teacher Education

A significant development in computer education in the country is the inclusion in every program or discipline of a subject entitled "Computers and Society". This subject is required of all students pursuing higher education degree programs including teacher education. The purpose of the course is to provide the students with an introduction into the inner workings of a computer system, what it can and cannot do and how it can assist in the solution of data processing problems. It also includes discussions on the impact of computers on society and the attending computer issues.

In addition to this 3-unit subject on Computers and Society, as mentioned earlier, teacher education students are required to take another 3-unit course on Principles of Teaching and Educational Technology including Computer Concepts. A syllabus for this course is still being prepared by the Bureau of Higher Education in coordination with the Philippine Association for Teacher Education (PAFTE)and with the assistance of the Philippine, Computer Society and the Consortium of Computer Schools. It is hoped that a prototype syllabus will be issued through a MECS Order before the next school year.

At the Philippine Normal College, the Bachelor of Science in Mathematics Teaching and the Bachelor of Science in Physics Teaching programs have also included in their curricula Computer 1 and Computer 2.

At the inservice level, certain educational institutions such as the De la Salle University and the Ateneo de Manila University have for the past three years been providing training to teachers from different schools in cooperation with different professional associations such as the Philippine Association of Colleges and Schools of Business (PACSB), the Philippine Association of Secretarial Education (PASE), the Association of Philippine Colleges of Arts and Sciences (APCAS), and the Ministry of Education, Culture and Sports (MECS). These two institutions have trained more than two hundred faculty members who will handle the Computer and Society course. A long term effort, these programs have solicited the support of the Philippine Computer Society which has created a committee to help the MECS and the different universities in the country which are in a position to help provide teacher training courses in computers. Other government institutions such as the Technology Resource Center, the National Manpower and Youth Council (NMYC) and the National Computer Center have embarked on a teacher trainers programs for selected higher education institutions in different parts of the country.

The University of the Philippines (U.P) College of Education and the IBM have entered into a contract with the latter providing the former with 17 units of microcomputers and providing training to the College staff and assistance to the three programs aimed at three levels, namely : Level I-Computer Awareness, Level II-Computers in the BSE curriculum and Level III-Computer for Special Faculty.

The U.P. Institute for Science and Mathematics EducationDevelopment (ISMED), an associated center of UNESCO APEID, has been undertaking inservice training courses on the use of microcomputers to strengthen mathematics and science education in the Philippines. Through the microcomputers network project, the ISMED in collaboration with the National Science and Technology Authority (NSTA), hopes to train the recipients of the 30 units FM-7 microcomputer donated by the Japanese Government on the following courses : FM-7 orientation, Wordstar, Supercalc, dBase II and F Basic Programming, etc.

In terms of other usages of computers in teacher education such as the CAI, the Philippines has yet to develop. Computer training centers such as I/ACT has introduced MicroPlato in the country and has conducted training, utilizing the courseware. The International School of Manila has also been reported as having implemented CAI in the country. Some private schools such as the Ateneo de Manila University, the De la Salle Greenhills and Claret School have also started implementing CAI, and have conducted staff development activities for their faculty.

IV.Technology in Promoting Teacher Education

(A) Aware of the importance of educational technology in the improvement of the quality of the teaching-learning process, the MECS formally launced in SY 1984-85 on experimental basis the "Tulong Aral" Program which is a Ministry-wide project using communication technology to assist the existing person-to-person method of teaching elementary and high school students and to facilitate inservice of teachers through the use of communication technology particularly radio and television.

The project which has two components, the Tulong-Aral on Television and Tulong-Aral on Radio, has two objectives, namely : first, to develop and evaluate the effectiveness of a media-assisted instructional approach in supplementing and enriching the classroom activities of students and the inservice training acquired by teachers ; and, second, to evolve a basic prototype to demonstrate the structure, functions and operations of an educational communication program so that informed decision can be made to the extent to which they should be integrated into the educational system after the completion of the Program for Decentralized Educational Development (PRODED) project in 1987.

The experience gained and information gathered for the pilot try-outshall serve as basis for the thrusts and directions of an educational communication program in the educational system of the country.

(B) The Philippine Government has requested the Japanese Government under the grants-in-aid program for 1986 to fund the building of a Educational Broadcasting Center including furnishing of equipment and production facilities capable of developing, producing transmiting and disseminating educational broadcast materials for the educational clients of the MECS. Included as one of the Center's functions is the production of prototype multi-media packages to be utilized in the pre-service and in-service education of teachers.

(C) The MECS has started the development of training complexes such as the Decentralized Learning Action Cells, Regional Learning Action Cells and the National Learning

Center. These are mechanisms and places that could serve as places for the inservice education of teachers. Equipped with the basic print and non-print media, these complexes will hopefully answer the training needs of teachers for their continued professional development.

(D) Pre-service and in-service teacher education pay close attention to the significant role of educational technology in the qualitative and quantitative effectiveness of development education. It is for this reason that teachers are introduced and get training in the utilization of educational radio, educational television, low-cost instructional aids, programmed instruction, integrated multi-media packages, CAI/CMI/teaching machines, media resource centers and microteaching.

6. THAILAND

1. Infrastructures

The education system in Thailand are devided into four levels, namely, preschool level, primary level, secondary level and tertiary level.

In accordance with the nation scheme of Education, both formal and nonformal is a life-long concern to all.

There are two ministries which are in charge of teacher education, namely Ministry of Education and Ministry of Universities. Among there are 71 institutions or teacher colleges all over the country.

There are four departments in the Ministry of education in charge of teacher Education namely

1. Department of Teacher Education
2. Department of Physical Education
3. Department of Drama and Arts
4. Institute of Technology and Vocational Education

Besides these there are 13 universities in the Ministry of Universities. Two of them are open universities. There are also 10 private institutions mostly offer courses in business and management.

Both Ministries, there are only two institutions which play the important roles on producing teacher for technical Education.

There are :-

1. Institute of Technology and Vocational Education
2. King Mongkut Institute of technology

Policy

In the National Fifth Education Development Plan (1982-

1986) states the policies in teacher education, some parts are :-

1. Decrease the number of enrollment in certificate level.
2. To coordinate policy and plan for the over all demand and supply of the nation.
3. To improve the curriculum, learning and teaching methods both in theory and practical in a appropriate ratio for the effective of teaching.
4. To expand some fields which are in the demand.
5. To encourage the cooperation among institutions, in producing and utilizing of resources and also provide and standardise for basic equipment.
6. To improve teacher Education by make use of innovation and technology for the development and utilization of manpower.
7. To encourage the cooperation among the teaching staff of the institutions efficiently.
8. To improve the method of recruitment.
9. Education for the community.
10. To promote and disseminate researches and stress on follow up studies and efficient teaching.

Research

Education researches are active mostly in the university. Research for advanced technologies for Teacher Education are rarely.

Otherinstitutions also have the important roles on the research, namely

1. Asian Institute of Technology
2. Ministry of Science and Technology
3. The National Research Council of Thailand
4. The Institute for Promotion of Teaching Science and Technology

The last plays more important roles on curriculum development from primary to the secondary level in mathematics and sciences.

Training

In order to become a teacher, according to the Law for Teacher Profession. One is required to obtain a teacher certificate. Elementary and Secondary school teachers are trained in the national universities or teacher college.

This law is passived for teachers of institution of higher education. Qualification for teachers at universities or junior or technical colleges are specified in the ordinance of Office of the Teacher Civil Service Commission.

Other

The current problems of Teacher Education are :-

1. Unemployment.
2. Quality of products.
3. Moral and attitude of instructors
4. Lack of cooperation between the producers and users.

2. Education Technology

All education institution have at least an audio-visual section or centre of education technology.

NowThailand has a nation wide radio network. for education by the cooperation of the Public Relation Department. Numbers of programme for education are under the responsibility of Ministry of Education Sukothai University, Ministry of Health,Ministry of Agriculture and cooperation.

The broadcasting of television education programme are conducted in the evening by the open universities.

Most of the education media,printed and non-printed are produced and supplied to the schools by the department or the institution concerned. More over, the Institute for Promotion of Teaching science and Technology (IPST) allso supports the upper secondary schools for production of teaching materials including text books,teacher's manuals, audio-visual aids some laboratory equipment and development of curriculum.

There are some agencies have their own training programme for their purpose such as

- Simulator for power plant training of EGAT
- Microcomputer Aids instruction in Centre for Educational Museumn.

3. Computer Education in Thailand

Computer education in Thailand started about 20 years ago at Chulalougkorn University and The NationalStatistie Office and then expanded to the other university level.

All the state universities have mini-computer or large which mainly support their administration function and for computer education. At the graduate level, there are three courses with strong emphasis on computer sciences which are conducted by Chulalougkorn University, Asian Institute of Technology (AIT) and The National Institute of Development Administration (NIDA).

The Computer Association of Thailand. also plays the key roles in providing computer education and for education.

From the last five years, numbers of micro-computer increased and aroused all schools and institutions. More than 8000 micro-computers were sold in the last year for small business and schools. The development of networksare introduced into the commercial banks.

There are more than 20 private computer schools have been set up and supported by the micro-computers.

Some computer companies have their own training development for their own personal and for support the buyers.

Micro-computers are now accepted at the secondary level. In 1983 some schools starts to have some basic electric courses in micro-computers. Mean while computer course will have been conducted in commercial state college for 10 years.

The MEO recognized the importance of computer used for daily living, so she established the policy on teaching of micro-computer in upper secondary level and vocational schools as a selective courses. The main objective is to develop basic understand of computer system and the basic programming. The IPST was assigned by the MEO to develop the curriculum for micro-computer, including institution media, teacher training programme as well as follow up and evaluation.

The IPST also runs some CAI in demonstration school of Srinakarinwirot University.

The MEO has appointed six teacher colleges to train 360 teacher per year is the computer training courses in 1985.

In the technical Institute basic courses in computer software and hardware are introduced for the electrical and electronic students. A diploma course for micro-computer maintenance is also conducted in 1985 in North Bangkok campus. The ITVE purpose to conduct micro-computer training course for 210 instructors a year.

The impact of micro-computer requirement from the institutions and the government agencies makes the government to aware about the expenditure and the fruitful utilization of computer.

In 1984, the government has set a national body assigned expressively to deal with the problem of preparing the nation and its people to effectively utilize of computer and information technologies for national development. The

National Computer Commitee,(NCC) consists of the representatives from relevant government departments and education.

The current problem is the shortage of resource persons both in softwares and hardwares. Lack of facilities available to the instructor and the school is also one of the majar problems.

4. The Role of Educational Technology in Teacher Education

Education technology has more important roles on teacher educations. Most institution s accept on the effective learning and teaching. But the advance in microcomputers have come about faster than the rate of absorption of the technology into the teacher Education.

The problems on the roles of the education Technology are about the economics for the individual producing of software and hardware. The government should set a policy and control for economics and effective utilization.

5. Current Activities of The Institute of Technology and Vocational Education

1) Trends in Teacher Education and Education Technology

The ITVE has an important roles on producing teacher for technical Education. Large number of technical instructors in most institution graduated from the ITVE.

The Engineering Faculty has more important roles on Education Technology and its innovations.

There are many projects for the improvement and development of technical education such as

- Loan Project for Improvement of Technical Education (LITE II - ADB Loan 1982-1986)
- OECF-Eleventh Yen loan Project for Technological Education (1985-1987)

The LITE II Project, 110 of instructors in different fields of 10 campuses were sent abroad for training.

On the implementation of the curriculum, many instruction materials have been developed.

More over the ITVE has set a project for the First-Phase of Computer Development (1984-1986) for the first priority of campuses. The objectives of the project are for :-

1. Computer study (Hw & Sw)
2. Teacher development Programme
3. M.I.S.
4. Student Registration and Evaluation.
5. Curriculum and Instructional Development.
6. Research.

About 40% of the 29 Campuses of the ITVE have 8 - bits microcomputer computers mostly are Apple'scompatible.The electronics department has more advantage of micro computer education both hardware and software. Some campuses have them for Business and Administration courses.

2) Trends in teacher Training and Education Technology in ITVE

The Engineering Faculty counducted many training courses in Education Technology including some courses in microcomputer which mostly full occupied.
Accordingto the mention Projects the ITVE hasto conduct microcomputer trainingcoursefor210 instructors a year.

The ITVE have more potential in advanced Technology to serve the need of this kind of manpower if it is supported by the government.

3) Problems involved

The implementation of the project faces many problems :-

a) Lack of teachers and qualified instructors

b) Lack of programmer, system programmers; software and hardware designer

c) Procurement problems due to low cost and qualities of the product.

d)Time constrain due to the approval process of the N.C.C.

7. JAPAN

1 Background

(1)General Information of Educational System in Japan

The structural organization of the present system of public education consists of kindergartens for pre-school education, elementary schools for primary education, lower and upper secondary schools for secondary education, and universities, graduate schools, junior colleges, technical colleges, special training schools and miscellaneous schools for higher education. Besides these special education schools through pre-school and secondary education are there.

General and special education through the elementary and lower secondary school level is compulsory; thereafter, and in other types of schools, it is voluntary. In principle, success in an entrance examination is one of the prerequisites to enter any school beyond the compulsory school level.

Kindergartens admit children aged 3, 4, or 5 and provide them with one-to-three-year courses.

There are three types of upper secondary school courses: full-time, part-time and correspondence. The full-time course lasts three years, while both the part-time and the correspondence courses four years or more. Part-time courses are of two types: day course and evening course. The majority of them are evening ones. Both the part-time and correspondence courses lead to a diploma equivalent to that available to students in the full-time course. In terms of the contents of teaching provided, the upper secondary school course may also be classified into two categories: technical, commercial, agricultural, fishery, home economics, fine arts, science-mathematics, etc.

Special education schools aim at giving physically or mentally handicapped children education adapted to their individual needs. There are schools for the blind, schools for the deaf, and schools for the otherwise handicapped.

Universities require for admission the completion upper secondary schooling or its equivalent, and offer at least 4-year courses leading to a bachelor's degree. They are divided into faculties such as law, literature, economics, education, science, technology and agriculture, and then sub-divided into departments. A university may set up a graduate school offering advanced study in a variety of fields leading to master's and doctor's degrees. More than half of the universities have set up graduate schools. The minimum length of master's course is two years beyond the bachelor's and that of the doctor's course, five years.

Junior Colleges provide upper secondary school graduates with two- or three-year programmes in different fields of study. Most courses offered in junior colleges are in the fields of humanities, social sciences, teacher training and home economics. The majority of the students in these colleges are women. The credits aquired at junior colleges may be counted as part of the credits leading to a bachelor's degree.

Technical colleges, unlike universities or junior colleges, require for admission the completion of lower secondary schooling, and offer 5-year consistent programmes aimed at training technicians. Technical colleges offer courses in mechanical engineering, electric engineering, chemical engineering, industrial chemistry, etc. Those students who are completed a technical college course may apply for admission to the upper division of a university.

There are also a number of "special training schools" and "miscellaneous schools" other than the regular schools mentioned above. Special training schools are designed to offer systematic programmes of education aimed at developing each student's ability required for their working life or daily life, or at raising their level of general education. Among such schools, the school offering "upper secondary course" is called "upper secondary special training school (kohtoh-senshu-gakkoh)" and that offering "advanced or college course" called "special training college (senmon-gakkoh)." The former requires for admission the completion of lower secondary schooling and the latter the completion of upper secondary schooling. In addition, there are many general courses in the schools opened to anyone regardless of one's educational qualifications. The length of each course must be one year ormore,with yearly teaching hours of 800 hours or more in principle.Each specialtrainingschool must consistently enroll 40 or more students.

Miscellaneous schools provide mainly young people with vocational and practical courses in dressmaking, cooking, bookkeeping, typing, automobile driving and repairing, computer techniques, etc. Most courses in miscellaneous schools require for admission the completion of lower secondary schooling, while some courses require the completion of an upper secondary school course. The length of course varies from three months, to one year or more.

(2)Teacher Certificates in Japan

Teachers at kindergartens, elementary and secondary schools have a relevant teaching certificate as provided for by the Educational Personnel Certification Law and other statutes concerned.

Certification requirements vary with school level. Teacher certificates for kindergartens and elementary schools are available for all subjects, while those for lower and upper secondary schools are available for specified subject areas.

Teacher certificates are divided into regular certificates and temporary ones. Persons who hold regular certificates are qualified for full teaching post. This type of certificates is subdivided into first and second class certificates. The basic qualifications for second class certificates for kindergarten, elementary and lower secondary teachers are to have studied for two years in a university (or the equivalent) and aquired 62 credits. The basic qualifications for first class certificates for elementary and lower secondary teachers and second class certificates for upper secondary teachers are to hold a bachelor's degree,while first certificates for upper secondary teachers are granted to those who hold a master's degree or who have studied for one year and aquired 30 credits beyond the bachelor's degree.

The students in teacher training courses are required, in addition to the above basic qualifications, to acquire the prescribed number of credits in two subject groups in courses approved by the Ministry of Education, Science and Culture; general education subjects, teaching and specialized subjects.

For certificates for teaching in lower and upper secondary schools, the prescribed number of credits in teaching subjects varies with the subject area. The number of credits required for obtaining teacher certificates in social studies, science, homemaking, industrial arts and vocational education subjects is more than that required in other subject areas.

Teachers seeking higher class certificates must earn additional credits and must have served for the prescribed number of years with good records as school teachers. The required credits may be aquired through in-service training(e.g., correspondence and other off-campus courses approved by the Ministry of Education, Science and Culture), or by attending regular university courses.

Those who have temporary certificates can be only assistant teachers. Temporary certificates for kindergarten, elementary and lower secondary school teachers are granted to upper secondary school graduates (or the equivalent) who have passed educational personnel examination conducted by prefectural boards of education. Such for upper secondary teachers are granted to those who have studied for two years in a university (or the equivalent) and aquired 62 credits.

Teacher certificates are granted by prefectural boards of education. Regular certificates are valid in all prefectures and for life, while temporary certificates are honored for three years only, and valid only in the prefecture issuing them.

(3)In-service Training of Teachers in Japan

The Ministry of Education, Science and Culture, Prefectural boards of education, prefectural educational centres, and some institutes or centres of national universities provide oppotunities for systematic in-service training for public school teachers, principals and supervisors. Some of the larger municipalities and educational study groups also hold workshops and study meetings for in-service training.

The ministry yearly holds the Central Workshops for intensive in-service training of principals, vice-principals and experienced teachers (e.g. curriculum coordinators, heads of teachers' groups teaching the same grade or the same subject in a school), who are selected and sent by every prefectural boards of education. Tsukuba Annex of the National Education Centre is specially facilitated and equipped for the Workshops, which are usually composed of lectures of high quality and seminars related to school administration, curriculum theory, instructional method, etc.

Prefectural, boards of education also make programmes for in-service training and carry out them. Prefectural education centre, which has lodging facilities, educational equipment and apparatus, and professional staff, takes an important role in in-service training. Recently, the Ministry and prefectural boards of education have been concerned in providing in-service training with newly recruited teachers and younger teachers with some five year's teaching experience as well as with those being in charge of managerial affairs.

Universities and education study groups which are voluntarily organized by school teachers also old workshops and study meetings.

Further, about five thousand principals, vice-principals and teachers a year participate in the above mentioned teachers' study tour abroad programmes sponsored by the Ministry of Education, Science and Culture and prefectural boards of education.

The Ministry of Education, Science and Culture give grants to prefectural boards of education and educational study groups for in-service training.

In Japan, the predominant aim of in-service training is in improving teachers' professional abilities and participation in in-service training programme is not normally rewarded with salary increase.

2 Current State of the Educational Uses of Microcomputers in Japan

(1) Government Policy

There exists a series of Government Policies concerning the introduction of new technologies such as microcomputers, videodisks and integrated teaching media.

1) March 1984

Consulting Committee to the Department of Non-formal Education, Ministry of Education, Science and Culture "Guidelines of the Curriculum for Teaching of the Educational Usage of Microcomputers (Intermediate Report)"

2) January 1985

CunsultingCommittee to the Department of Non-formal Education, Ministry of Education, Science and Culture "Computer Uses in Education (Intermediate Report)"

3) March 1985

Consulting Committee on Science and Vocational Education to the Department of Higher-Education, Ministry of Education, Science and Culture "Proposal for Introducing subject like Information Sciences into regular high-schools"

4) June 1985

Department of Non-formal Education, Ministry of Education, Science and Culture "Two-years Research Project in formal and non-formal

education institutions on micros in education"
(Seven prefectures were granted.)

5) June 1985
Ministry of Education, Science and Culture
"Budgetary Programme to Facilitate High Technological Teaching-leaning Media in Schools"

6) August 1985
Consulting Committee to the Department of Formal Education, Ministry of Education, Science and Culture
"First Research Report on the Formal Education in the Information Age"

7) December 1985
Consulting Committee to the Department of Non-formal Education, Ministry of Education, Science and Culture
"Guidelines for the Development of Educational Software"

Based on these official reports and/or research grants many local governments and institutions started to develop computer literacy programmes for students as well as teachers. Besides these there are various kinds of volunteers groups who has been conducting computer training courses with the assistance of the faculty members in the teacher training universities and staff from local computer companies.

(2) Three Roles of the Microcomputer in Education

At the present time, the microcomputer has three distinct roles to play in education in Japan.

1) The first role: learning about the microcomputer

Regarding the first role, the microcomputer is used as an object to be studied. This type of learning is usually refered to as education for the computer literacy and for information services. It includes two main areas:

(i) Learning about how computers operate and developing the knowledge and skills of programming.

(ii) Learning about its social implications, usually known as computer awareness.

2) The second role: using microcomputers to process research data.

The second role is related to using microcomputer as a tool for processing data on educational research. This includes statistical analysis of educational data from the viewpoint of research and utilization of microcomputer software on information processing.

3) The third role: using microcomputer to assist the learning/instructional process.

The third role is perhaps the most fast growing role for microcomputers in education. Their uses in this area can be divided into three categories:

(i) microcomputer assisted audiovisual education.

This refers to using microcomputer for audiovisual presentation in an instructional system. There are four possible areas for such usage:

a. visual and graphic presentation of teaching materials.
b. visual presentation of simulation.
c. audiovisual presentation of teaching materials.
d. development and control of educational equipment and devices.

(ii) CAI

The microcomputer is used to administer instruction according to the programme written by the courseware authors. Students interact with the computer programme/courseware via terminals, the courseware which programmes the computer determines the mode of interaction. Such mode of interaction may be divided into several non-exclusive categories: tutorial, drill and practice, simulation, instructional gaming, demonstration,informational and instructional management. The effectiveness of such a system on promoting learning depends on the quality of the courseware being used.

(iii) CMI

The microcomputer is involved in the management of an instructional system. Their uses in this area may be identified as follows:

- a. to design, store and retrieve instructional materials.
- b. to store and retrieve educational information.
- c. for evaluating and improving classroom instruction.
- d. for assisting educational administration.
- e. for assisting evaluation and assesment.

(3) Uses of Microcomputer in Scools and Facilities for Social Education

In 1984, the Ministry of Education, Science and Culture had conducted a survey on the computing facilities in the local schools. According this survey as of May 1, 1984, the percentages of schools installed with microcomputers might be said very low. Only 0.6% of the elementary schools and 3.1% of the lower secondary schools have microcomputers. However, the percentage is much higher in upper secondary schools, which is 56.4%. The same survey also includes the data from the various facilities catering for social education such as in public halls, libraries, museums. The percentage of these facilities having microcomputer range from 0.5% to 10.3%.

Regarding the uses of microcomputer in schools with computing facilities, it was found that 70% of the elementary uses microcomputer in CAI, but 70% of the lower secondary school and 63% of the upper secondary school use them in CMI. Among some of these schools, microcomputers are also being used in computer literacy classes or club activities. 78% of the microcomputer in facilities for social education are being used in CMI.

The above data seems to give the impression that microcomputers are not popular in Japan. This could be true to some extent in the school setting, but it is certainly a true reflection of the extent to which researchers on the educational usage of microcomputer are being carried in Japan. Over the past few years ther has been an increasing interest in researches on microcomputer and its educational usages.

Most of the research papers in this area specially in CAI have increased significantly in the past three years. Some of them are the followings:

(4) Courseware Development

The development of courseware in the form of writing computer programmes has been carried out not only by the commercial firms researchers but also by individual teachers on their own initiatives and by research groups in many universities. Most of the programmes are written in drill and practice or simulation modes for subjects such as mathematics, physics, languages and engineering. Though there are various kinds of programmes, when it comes to the quality of the programme, it might be said there are so few that it should be considered the quality of those in terms of the efficiency as well as motivation of the students.

3 Concluding Remarks

The uses of computer in education has developed since the sixties, yet it is the advent of the microcomputers in the recent years that opens up a wider scope for their uses in the instructional systems and hence triggers off a drastic increase of research in this area.

Chapter III

COMMON ISSUES AND DISCUSSIONS

Thischapter synthesizes the discussion on problems and issues common to the participating countries.

Education is now regarded as one of the major inputs to a country's social and economic development. And in education, the teacher must play a vital role. Teacher education, therefore, has an extremely important function.

Teacher education, however, is not functioning in such a way that it provides teachers with adequate expertise to catch up with the rapid change of the world because it faces a variety of difficulties, e.g. paucity of funds, lack of qualified teacher educators, continuously increasing demand for teachers. One of the possible solutions to this problem is appropriate use of advanced educational technology.

Advanced educational technology highlighted in the discussions at the present seminar is computer and its related technology though it may encompass a wide range of technologies.

The participants identified the following seven problem areas and discussed in detail.

1. Provision of Hardware

Acquisition of educational hardware (especially advanced technology hardware) is problematical inmost of the countries in the Asian and Pacific region due to financial constraints, technology transfer, etc. If hardware is acquired, selection and maintenance can pose a problem.

Appropriate use of technologies is also problematical because it is limited by infrastructural readiness. This is further confounded by the inhibition of some teachers to use these technologies.

Policy makers and funding agencies need to be make aware of the importance of the use of technology in education. Unless the educational decision makers are convinced, even the acquisition of the hardware is impossible.

2. Manpower Requirement

Lack of experts, teachers, programmers, system designers, etc. is a serious drawback to increased utilization of advanced educational technology in teacher education and encouraged preparation of teachers for technology utilization in their teaching activities in the future.

Teacher training at traditional institutions tends to focus on specific uses of particular new technological products rather than on actual uses in teaching - learning situations. The emphasis of teacher training should not be on new gadgets but on their appropriate uses.

3. Software Development

Software development seems to lag behind the hardware. Software development requires a collaborative undertaking of media specialists, programmers, system designers, subject specialists and teachers. The experiences of the participating countries show that teachers can develop their own software, and they should be encouraged to do so.

Software development should take into consideration the ease with which the teachers can use them. Teachers need training in the use of the software and should be made very clear the thinking or the rationale behind the software. General purpose software should be promoted for educational use. For example, word processing software and data base are very useful, because teachers are freely able to inputdata according to their own needs. In compatibility of software with available hardware is another problem area. Software development should be conducted in ways which are relevant to the local needs and which will make local teachers aware of the importance of systematic approaches to their teaching activities (e.g. planning and evaluation of their instruction).

Standardization of software needs to be collaborative rather than competitive.

Other problems related to software development are copyright, language, culture orientation, differential classroom needs, standardization, specification and preservation. In addition, software must be continuously updated, and educational institution should have access to such updated facilities.

4. Equality of Access to Advanced Educational Technology Facilities

The problem of equality in access to advanced educational technology is keenly sensed by the participants. Several aspects have to be considered related to this issue. First, the problem of providing equal resources to urban and rural areas. In some countries, electricity is not available in many rural areas. The second aspect concerns the type of schools or affluence of school districts/communities. Private elite schools may be able to purchase more microcomputers than the public and less affluent private schools. Students from rich families may have more personal computers at home than the less affluent families.

The equality of access issue has implications also for the use of microcomputers in schools. Some schools with children from higher income groups would use computers to develop problem-solving materials or approach (that is, students programming computers) whereas students from lower income background may use computers for drill and practice, that is, computers programming students.

The issue , therefore , is whether the advanced educational technology such as the computers will widen the gap between the haves and the have nots or it will be used to reduce the gap.Therole of national authority will be to ensure that thecommercialinterest and otherfactors donot have adverse effects in promoting the use of technology.

5. Curriculum Planning and Development in Advanced Educational Technology for Teacher Education

Questions related to the contents of courses in advanced educational technology in teacher education and the procedure by which they will be offered were raised. Should the focus of teacher education be study of technology per se or uses of technology ? Should such courses be specially mandatory in teacher education curriculums or should they be made as electives ? Should they be computer literacy, computer fluency or specialist course in computers ?

6. Interactive Teaching-Learning

Advanced technology can be utilized in a variety of ways according to the needs of each educational environment. It can be utilized so that existing traditional modes of teaching are facilitated and improved. At the same time, however, it can contribute to the enhancement of more effective modes of learning, e.g. interactive learning.

For example, the discovery or problem solving approaches may not be immediately relevant in setting where teaching systems are inflexible. In these circumstances, the new technologies can be promoted as a means for enhancing the quality and efficiency of teaching and learning methods. High quality software is needed which can provide demonstration and intellectual tools for the use of the teacher. Nevertheless, the participants to the seminar encourage educators to explore the growing possibilities for interactive learning with computers. It needs to be stressed that never technologies have great potential for altering the whole approach to learning, particularly for providing opportunities for self-directed and explanatory learning.

7. Social Impact and Problems of Adjustment Brought About by Advanced Educational Technology

Certain concerns about the use of computers are common among people such as;

- leads to inflexible thinking
- excessive involvement with programing promotes convergent behavior
- reduces opportunities for social interaction
- may replace teachers
- creates unemployment.

Teacher education courses should be designed to illustrate ways in which computers may be used to promote creative thinking, to increase the amount and quality of social interaction and enhance the role of the teacher.

The critical issue is the way in which the technology is used rather than with the technology itself.

The social impact of advanced technologies will depend to a great extent upon decisions about their educational uses.

Chapter IV

STUDY VISITS

1. Study Visit to Kyoto University of Education

The visit to Kyoto University of Education was proceded by an unforgettable Japanese lunch at the Seiwaso Inn given by our hosts. After lunch, the group proceeded to the University and attended a briefing at the office of the President.

The University was established in 1949 as Kyoto Gakugei University but its origin can be traced back to the Kyoto Normal School which was founded in 1876. It now has 14 Departments covering the spectrum of school curricula and also specific areas like Special Education, Infant Education and Educational Research and Training. The Faculty of Education also has seven laboratory schools under its wing. The various departments offer four-year undergraduate courses in education as well as one-year postgraduate programmes on specific aspects of education. In all, the University has a student enrolment of about 1800 and professional and support staff of about 420, including teachers in the laboratory schools.

The second half of the visit was spent at the Center for Educational Research and Training, where Professor Nishinosono and Associate Professor Yamakawa briefed the visitors on the many activities of the Center. In particular, the briefing focused on the one-semester elective course on "Training of Basic Teaching Skills" which the Center has mounted. The thrust of the programme is a shift from the traditional "learning by hearing" to "learning by doing". Therefore, a multiplicity of strategies is adopted including group discussions, observations, acquisition of skills through microteaching and the utilisation of self-instructional modules developed by the Center. The briefing was also supplemented by a slide show on some of the activities carried out by students. A lively discussion followed on various aspects of pedagogy courses in teacher education programmes. A number of interesting issues were raised but all too soon the discussion had to stop as the group had to rush back to the station to catch the Shinkansen(Bullet Train) back to Tokyo. It was a most enjoyable and educational experience for all.

2. Study Visit to Kyoto Municipal Science Centre for Youth

The participants visited Kyoto Municipal Science Centre for Youth in the morning of Monday, October 14, 1985. They were briefed by the key staff of the Centre on the philosophy and the guiding principle for which it was established. It was emphasized that the aim of the Centre is to foster future citizens with the scientist's spirit which means "the scientific method such as ways of looking at, thinking over, and evaluating things by scientists who are devoting themselves to research in the laboratory, as well as their mental attitude to apply it to the practical use." The realization of this scientist's spirit has been the guiding principle of the Centre since it was inaugurated in May 1969.

The participants learned that the Centre's activities are focused on three projects,namely : Study at theCentre, Training of Teachers and Science Education for the Citizens. Under the first project,elementary, junior and senior high school students come to the Centre to experience the scientist's spirit through contact with the Centre's staff, actually using the laboratory facilities, operating thetools and watching the exhibits among others. In the second project, schoolteachers come to the Centre for the purpose of actuallyreceiving inservice instructions from Centre's staff or by themselves acquire the scientist's spirit by learning independently through actual manipulation of materials and tools provided to them by the Staff. In addition various researches are conducted by the Staff to improve science education. The third project involves the participation of the citizens of Kyoto in the programmes and projects of the Centre by making the facilities available for public use.

The most exciting part of the visit was the actual mini-instruction provided by the Centre staff in physics and biology, where the participants were made to manipulate the tools and materials and perform the experiment. A guided tour of the laboratories, exhibition halls, the workshops and lecture rooms gave the participants added insight on how science education through experiential learning could be provided and improved in their respective countries. A very important learning acquired by the paticipants is the potential of such a Centre in developing teacher creativity through production/development of improvised devices and other equipment as well as other teaching devices which they can use in their teaching.

The participants found the visit extremely informative and worth exploring or adapting in their respective countries.

3. Study Visit to Ooizumi Campus of Tokyo Gakugei University

In the afternoon of Tuesday, October 16th, the seminar participants made a study visit to the Ooizumi elementary school attached to Tokyo Gakugei University.

The participants received a warm welcome by the vice principal Mr. S. Sakai and his staff members. Mr.Sakai showed the participants the activities of the school from the videotape. The total members of the staff are 40 and 30 of them are teachers. There are 728 students in the school for 18 classes, among these 3 classes are set for the Oversea Japanese students.

The purpose of the school are ;

1. Conduct the experiment to the best teaching method
2. Service for Teacher Training
3. Serve Japanese students returned from abroad

the school provides classes for 200 teacher student to have their 3-weeks teaching practice each year. Most of them are the third year students.

Mr.Sakai showed the participants the school facilities. At the rest of the visiting time, the participantsobserved the practice teaching of the teacher student in the classrooms of grade 5th and 6th with teaching media; OHP, chartsand chalkboard, also the studio and control room for broadcasting. There is a language laboratory for the Japanese pupils from oversea. The participants also observed the microteaching group. The discussion were about the administration problems of the school and the interaction between the faculty member and the teacher for the effective instruction.

4. Study Visit to the National Institute of MultiMedia Education and the University of the Air

Facilities and Functions

Due to luck with the Tokyo traffic, delegates arrived early for their visit. The visit began with an introduction to the operation of the National Institute of MultiMedia Education(or Hoso Kyoiku Kaihatsu Center-HKC) by Mr.Yasuo Kobayashi, the vice President, a comprehensive booklet was given to each delegate which shows information concerning the objectives, organization, employees, budget, facilities and details of its research and development operations. It was pointed out that the center was established in October 1978 as a national University joint-use institution. It was set-up to serve the following functions :

- to conductresearch and development into university education using broadcasting.
- to make its facilities available to instructors and researchers from Japanese universities.
- to cooperate in developing materials with universities, in particular the University of the Air
- to conduct cooperative research with facutly members from universities.

At this session, delegates raised questions concerning the research and development functions of the center. Delegates were impressed by the range and quality of the research which has been associated with the center since its inception.

We were introduced to Prof.Kenji Fujita, a specialist in measurment of human performance who was appointed recentry to carry out systematic research into student responses to broadcasting media.

At this point we proceeded with a guidedfour of the facilities. An Apple IIc microcomputer was employed to make communication with information and dialog systems in the United States. Of particular interest were systems enabling self-directed learning and providing an educational forum for teachers. We were imformed that a growing number of Japanese teachers are using these electronic communication systems. This demonstrates a use of sophisticated technology for promoting teacher education on an individual basis.

Next, we were shown the TV and radio studios together with the control rooms and editing rooms. Delegates were impressed by the advanced facilities for the research, development and production of audio-visual teaching materials. The equipment is undoubtedly "state of the art" and the arrangement and organization for its use are superb. Delegates felt that the facilities must be unequalled anywhere.

In one TV studio we saw the recording of an introductory program for the University of the Air. The session seemed more appropriate for a national television network than a production in an educational facility.

At this point we returned to the meeting room for a presentation by Mr. M. Takaishi the Director of the Administrative Division of the Center. Mr.M. Akahori gave more information concerning the experimental courses developed since 1978. Questions were raised concerning budgets and staffing. It was pointed out that the staff total is now.

Some discussion was held concerning the arrangements for universities to make TV and radio programs for local use. Of particular interest was the reported involvement of local commercial TV stations in the process. It is rare in other countries for commercial interests to make such substantial contributions in association with universities.

A sizable portion of the discussion surrounded the relationship between the center and the University of the Air. We were informed that the University of the Air only began broadcasting in April of 1985 and that the Center has been involved in the production of experimental films, programs and textbooks for the courses.

The university employs a private broadcasting channel and staff from the Center help with the evaluation of the programs.

In the future the center will produce every TV and radio program for the University. So far it has prepared 300 forty five minutes programs for TV and 600 forty five minute programs for radio. We were told that 80-90% of the work of the Center is for the University of the Air. Programs are prepared one year before they are used and then they will be used for three consecutive years.

The party proceeded to see the broadcast facilities for TV and radio productions. We saw the equipment for transmitting and monitory signals to the Tokyo tower. Once again the delegates were overwhelmed by the modern and sophisticated facilities.

Next we were taken to a meeting room at the University of the Air where we were met by the Vice President Y. Kobayashi who described the organization and function of the university. Again, we were presented with a comprehensive and informative booklet, which stresses that the main aim of the university is to provide Japanese people with opportunities for lifelong university level education. The main points to emerge from the presentation and subsequent discussion include:-

- The University hopes to disseminate university education through close cooperation with traditional universities. At the moment no university has made a decision to transfer credit points.
- Initially the University is restricted in its broadcast target areas to six prefectures. At a later stage it may be permitted to increase the enrolment to other areas, possibly with satellite transmission of broadcasts. For the first years the University is perceived to be experimental.
- The University was established with special law. The

buildings, station and land were funded by the government. The running costs come from subsidy and tuition fees.

- It has been estimated that student fees are equivalent to 1/3 of the actual cost for tuition at national universities.
- The university had planned to gradually increase the number of students, but it had a maximum enrolment of around 18,000(regular plus others) in 1985. Enrolment of30,000 students are predicted in 4 years time.
- Enrolments in existing private university correspondence courses have not been affected by the opening of the University of the Air. There may be two reasons. In Japan there is a growing awareness of life-long education and the private universities provide correspondence courses in teacher training which are not offered by the University of the Air.
- The University has designed its courses on the premise that people need a broad education and a widening of perception before specializing. Nevertheless within its single faculty of Liberal Arts it is possible to study options in a specialized way. With appropriate advice from staff and choice of research for graduation a student can complete acourse commensurate will those offered in other universities.
- The university does not offer any kind of certification or credential for occupations such as teaching.
- During 1985, 88% of the students passed at least one of their exams. About 1/3 of the students have completed all requirements to this point. This compares more than favorably with similar institutions in other countries.
- Examinations are a mixture of essay and multiple choice, The latter form of assessment is used whenever possible.
- Entrance to courses is based on a 'firstcome - first served' basis.
- In addition to the broadcast lectures and study materials, students must attend classroom instruction at a study center.

Following this session we inspected one of the study centers and observed a center class, science laboratory, the library and the broadcast re-viewing facilities. As before, the facilities were modern, sophisticated and impresive.

The bus then returned the visiting delegates to the Hotel.

Implications for Seminar

While the institutions visited are not directly concerned with teacher education and technology, they provide models for the use of sophistcated technology in tertiary education.

Information gained from the research and development enterprises will prove invaluable for those concerned with training teachersin effective uses of technology for instruction.

5. Study Visit to the Library and the Center for Educational Technology in Tokyo Gakugei University

The participants of this seminar visited the Tokyo Gakugei University Library first, and then the Center for Educational Technology on 18th October, 1985, in the morning.

The operating and management systems of the library are well computerized, and information retrieval systems which is connected with the data-base of University of Tsukuba via telephone network are also well constructed. The numbers of books kept in this library reach to about 700,000 volumes and serials reach to about 5,600 titles.

The storage capacity of this library is about 440,000 volumes, so the problem of the insufficient space is well solved with economical storage system like use of the moving shelves.

The objectives of the Center for Educational Technology are two ; one is the improvement of school curriculum, the other is the improvement of educational method and university teaching. For these two objectives the center is well equipped with various educational facilities, for examples, educational information processing system, combined C.C.T.V. system including TV studio and multi-guided instructional system.

The center has performed and been performing many researches and development of educational methods.

Especially it was very impressive for the educational information science laboratory to study and develop CAI programmes of arithmetic of elementary school curriculum.

SUMMARY OF INTRODUCTORY TALK

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1. PREFACE

From an informational point of view, an educational system in which teachers instruct students is composed of two factors: information transmission and its processing between the two groups. Using a communication technology which can easily and more effectively transmit information, recently developed educational systems and equipment contribute to the above two factors. Communication technology, in particular, plays a very important role in education.

The remarkable progress of communication technology and electronic, computer-related equipment is now allowing the integration of electrical communication with information processing, areas which have long been considered different categories. This new integrated system is developing rapidly and thus must be included in any discussion of the overall subject of communication technology.

In this short report, which contains the most recent data available, Japan's advanced communication methods and its related education/training technology, as well as the educational use of new media now gaining in popularity throughout the country will be fully discussed. It is hoped that it will serve to provide at least a glimpse of the country's present status in this field.

2. INTRODUCTION

Japan is now called by a new information-oriented society. Much news relating to the new media can be found in newspapers, magazines and on television. Systems such as CATV, two-way television, the CAPTAIN system, INS, communication satellites, electronic banking and home shopping are expected to change our daily lives and our education system drastically, making them more comfortable. This is due to our longing for a better future society. Everyone seems interested now in new media technology and recognizes its promise to bring a happy way of living in the future. As the hardware indicates, the new media is a result of the rapid development of electronic technology. Semiconductors made LSIs much cheaper, which then made digital processing easier. As a result, various OA (office automation) equipment items including personal computers have appeared in business circles, most of which have begun to be utilized as teaching tools or systems in education.

Many of the new media are based on the development of electric communication technology which began from wire communication, extended to wireless communication and has now reached satellite communication. Optical communication technology has made the most remarkable progress. In the opitcal fiber communication system, a huge amount of information can be transmitted to distant places by means of light via optical fiber cables. Japan leads the world in this optical communication technology, and a highly reliable system is already in actual use accompanied by the digital technology mentioned above. Thus new media, with the new electric communication technology, is steadily occupying an ever more important position in our society.

Let us consider the amount of information flow in Japan. This can be divided into two categories: "information-supply" and "information-consumption." Information-supply refers to the usable information supplied to users, while information-consumption is the actual information used from the usable information supplied.

According to the Report on the Present State of Communications in Japan, published by the Ministry of Post and Telecommunications in 1982, the total amount of information-supply as of 1981 was about 1.9 times that of 10 years ago and increased by 3.5% over 1980. The following table shows a classification by media for 1981.

Table 2-1 : Ratio of Media to Information Used

Fiscal year	1981	1983
Television	57.8%	55.9%
Conversation	21.6	22.4
Formal Education	11.3	11.8
CATV	3.3	3.7
Play and Sports	1.3	1.3
Radio	1.1	1.0
Others	3.6	3.9

Table 2-2 : Ratio of Media Use to Information Supplied

Fiscal year	1981	1983
Broadcasting Television	76.4%	76.2%
Broadcasting Radio	16.7	16.4
CATV	4.4	5.1
Newspaper	1.4	1.3
Others	1.1	1.0

As shown, electrical communication media such as TV broadcasting ranks at the top providing 97.7% of the amount of information-supply, thus indicating the important role of communication technology in contemporary life. In information-consumption, TV again holds the top seat; however, businesses and schools, both of which hold less than 1% of the amount of information-supply, occupy quite a high ratio. This shows that the information supplied to education is well consumed compared with other categories.

The actual amount of effective consumption of the information supplied by the above media is rather limited. The rate of consumption, that is, the proportion of the amount supplied to that consumed, is decreasing annually; the rate in 1983 was only 6.5%. Although this is because of the great amount of information supplied by television or radio broadcasting, it does show that Japan is now in an over-supplied information age. This does not necessarily indicate an excess of useless information; the information itself is becoming more individual and specialized. Accordingly, people's requirements from the communication media which transmit needed information immediately are increasing. As shown by the rate of increase in the amount of information supply, the percentage of items related to data communication is extraordinarily high--an indication of the great expectations for communication technology in future Japan. With this situation as a starting point, this short report will discuss the application and the role of communication and its related technolgy to education and training.

3. BROADCASTING

3.1 Current Status

Japanese broadcasting services are provided by Nippon Hoso Kyokai (NHK) and private broadcasting firms. NHK is a public broadcasting organization which has an obligation to provide reasonable quality radio and TV programs to subscribers throughout the country. All television set owners are required by law to pay a subscription fee to NHK.

Table 3-1 shows the length of the NHK television broadcasting services per week in 1982. These services are also offered on two channels, one for general programs and the other for educational. On the latter, broadcasts of entirely educational programs total 98 hours and 51 minutes per week, an average of 14 hours and 7 minutes per day. These programs are mainly for schools; primary schools often use them as classroom lessons. In the broadcasting services offered by private firms there are both sponsored and independent programs; the former accounted for 77.7% of the 1983 programs. Predictably, these contain many commercials.

Table 3-2 shows the length and content of the radio/TV broadcasting services of private firms in 1983. The ratio of educational programs is quite low compared with those offered by NHK, 5.1% in radio and 12.4% in TV. These ratios are increased to 25% and 36.6% respectively by adding the general culture programs, which is about the same as other years.

Table 3-1 : NHK TV Broadcasting Services per Week (1983)

	General channel hours	General channel ratio	Educational channel hours	Educational channel ratio
	h m	%	h m	%
News	50.34	40.4	3.49	3.0
Educational	17.38	14.1	98.54	78.5
General Culture	30.52	24.6	23.17	18.5
Amusement	26.14	20.9	---	--
Total	125.18	100.0%	126.00	100.0%

Table 3-2 : Total Daily Length of Educational Programs

	Radio Educational	Radio Cultural	Television Educational	Television Cultural
	h m	h m	h m	h m
NHK (2 channels)	14.38	16.57	16.39	10.55
Private (5 channels)	6.00	22.30	11.05	21.25
Total	20.38	39.27	27.54	29.07

The lengths of the programs broadcasted by the five private companies shown in the above table are based on services which are available only in urban districts such as Tokyo or Osaka. These periods are shortened in rural districts which usually have availability to only 3 of these channels. It is rather immediately apparent that there are many educational programs available when someone wants to study in Japan.

Table 3-3 shows the result of a nationwide audience rating poll conducted by NHK in November 1983. The rating for TV (even for a very short period) is 92% both on weekdays and 91% on Sundays. This means that almost every person throughout the country watches TV once every day. The average viewing time is 3 hours and 21 minutes on weekdays and increases to 3 hours and 56 minutes on Sundays. The nationwide audience rating for radio is much lower at 31% on weekdays, although it is quite steady.

Table 3-3 : Percentage of Listening and Viewing Audience Older than 7 years and Hours per Day (November 1983)

	Radio		Television	
	ratio	hours/day	ratio	hours/day
	%	h m	%	h m
Weekdays	31	41	92	3.21
Sundays	21	28	91	3.56

According to the research by NHK in November 1983, the average period of television viewing by students of primary and junior high schools on weekdays is:

Primary school	2 hours 17 minutes
Junior high school	2 hours 10 minutes

However, the periods on Sundays increased for both groups by 50 minutes. Previously, 2 hours 54 minutes had been the peak length of TV watching on weekdays by primary school students (1973) and 2 hours 48 minutes by junior high school students (1974). So the 1983 lengths both showed a decrease. On Sundays, the decreases are even greater: for primary school students the length is 1 hour 15 minutes less than the 1974 peak of 4 hours 2 minutes, and for junior high school students 1 hour 38 minutes less than the peak of 4 hours 38 minutes,the same year.

One reason for this decline is the appearance of various new media such as headphone-type stereo cassette tape recorders and FM radio broadcasting. Another reason is the increase in the number of private schools for supplemental studies so that students do not have as much time to watch TV in the evenings.

As indicated by the above research, Japanese obtain a great deal of media information, especially from television. However, the audience rating for educational programs is generally low. This means that people do not watch many educational programs, despite the long broadcasting time and general TV viewing time.

4. SATELLITE

DBS (Direct Broadcasting Satellite)

Because the actual use of the CATV is limited by Law and the microwave junction lines are well developed in Japan, the 4GHz-band broadcasting satellite for use in TV relay broadcasting has not yet been launched. However, since launching of the country's first experimental broadcasting satellite, the 1978-39A called "Yuri", direct TV broadcasting with 12GHz has been the subject of continuous experimentation for home use.

In January 24, 1984, the second broadcasting satellite, BS-2A was launched for direct TV broadcasting. The frequency is 12GHz and 2 channels will be relayed, each of which has a band width of 27MHz. The signal will be receivable with a small antenna of about 75cm diameter in the central part of Japan. NHK will start actual broadcasting with BS-2A from May, 1984. The visual images and voices will be sent by FM and pulse code modulation(PCM) technique respectively to provide better TV reception in mountainous districts or on solitary islands. high density television(HDTV),PCM broadcasting, still picture and facsimile broadcasting are scheduled for experiments. The main ground station will be set up at the NHK broadcasting center in Tokyo and the substation will be located in Osaka. Mobile stations will also to be established to produce and send independent programs. To receive these broadcasts a dish antenna and tuner costing around $1,000 will be required.

As the expected lifespan of BS-2 is 4-5 years, the next broadcasting satellite BS-3 is planned for launching in 1989. With BS-3, 4-channel TV and other new services will be possible. From now on the University of the Air may be broadcasted through the above satellite, and this will apply to other programs as well.

5. CATV

5.1 CATV in Japan

CATV is now commonly recognized as the abbreviation for Cable Television. However, in Japan CATV actually indicates Community Antenna Television or Common Antenna Television, where TV programs are first sent to the CATV centers from the broadcasting station and then sent to private homes through cable.

CATV in Japan began in the 1950s in order to eliminate poor signal reception in mountainous districts and in big cities. CATV centers having more than 501 subscriber terminals require the permission of MPT (Ministry of Post and Telecommunication), and 68.7% of these centers were set up for the sole purpose of eliminating poor signal reception. If the centers established both for this reason and also to offer more diversified programs and eliminate unsightly roof antennas in dense residential areas are added the percentage increases to 86.4%. Prefectures such as Tokyo, Osaka, Hyogo, Kanagawa and Aichi, which include big cities, set up many CATV centers, because in these cities poor signal reception is common due to high buildings, highways, ultra-high voltage lines, etc.

Most centers merely receive TV programs and broadcast them. However, quite recently some have started to do independent broadcasting and their number is gradually increasing; for example, 10.4% more centers did both simultaneous and independent broadcasts in 1983 than in 1982. The number of centers which have started independent broadcasting is 62, 14.5% of the total. Among them, those doing unique and education-related independent broadcasting have introduced the following applications:

1. Broadcasting in primary and junior high schools as an audio-visual education tool

2. Broadcasting in English in apartments or hotels in the center of the Tokyo metropolis

Table 5-1 : Program Content of Independent Broadcasts

News	24%
Culture	22
Public administration notices	18
Hobbies/amusements	12
Practical information for daily living	10
Education	8
Sports	3
Advertising	1
Other	2

As seen, educational programs account for 8% of all programs.

CATV has begun to attract attention and has become a part of the recent new media boom. Making good use of coaxial cables and their capability to carry more than 30 program channels as well as two-way communication, and also making practical use of optical cables, CATV is now rapidly changing its former image. Rather than being just a solution to poor TV reception, it is emerging as a unique information medium spontaneously reflecting the economic and cultural conditions of the society and districts it reaches.

5.2 HI-OVIS

HI-OVIS (Highly Interactive Optical Visual Information System) started its service with 158 subscribers and 10 public institutions which are connected to the center by means of optical fiber cables. The HI-OVIS experiment is the forerunner of a future type of interactive CATV service where audio-visual systems will be reconsidered.

Among the number of character-only-programs and still pictures requested,the train timetable holds the highest percentage, followed by news and weather forecasts. To date the requests for the educational programs have not been many. The following table shows the requested programs for which subscribers agree to pay.

Table 5-2 : Programs Requested which Require Payment

Type of Programs	Agreement
Foreign theater films	62.7 (%)
Theater films not yet broadcasted on TV	43.2
Japanese theater films	41.4
Educational, industrial and documentary films	32.5
TV program rebroadcasts	30.1
Educational programs for children	26.0
Technical education programs	10.7
Adult films	8.9

Subscribers do agree to pay for educational programs. There are various kinds of such programs being broadcasted, among which English conversation lessons account for the highest percentage. A series of open lecture planned by Tezukayama University located near the HI-OVIS quarter will be broadcasted in future.

5.3 CCTV

Although CCTV (Closed Circuit Television) was originally developed as an industrial administration system, it has also been applied to educational uses. The faculty of educations of national universities began in 1970 to set up CCTV systems with their "affiliated schools" via cable. (These affiliated schools are schools administered by an individual university at a separate location; teachers are often from the Faculty of Education of the parent university.) At present, 24 universities have installed these CCTV systems.

6. FACSIMILE

6.1 General Description

The facsimile(FAX) is one of the most convenient communication methods in Japan where Kanji, complicated Chinese characters, are used and this equipment has been in practical use from its early stage. In 1971 the Public Telecommunication Law allowed the installation of facsimiles using telephone networks. Since then, facsimiles have gained rapid popularity and have spread from major companies and offices to small companies, shops and even individuals.

Facsimiles are also used in education, as will be discussed later. The number of facsimiles installed in Japan has rapidly increased and at present, with a growth of 56.2% between 1983 and 1984, 486,500 instruments are in use. Until quite recently facsimile services were provided chiefly through telephone networks, however, in September 1981 an independent facsimile network began service, increasing speed efficiency and reducing the communication cost for intermidiate and long distances.

6.2 Facsimile Application to the Joint Achievement Examination

In order to enter a university in Japan, one must pass the Joint Achievement Examination held at the same time on the same day nationwide. In January 1984, 341,425 examinees tackled this examination at 279 locations.

At the time the examination is given, a facsimile network is established between the National Center for University Entrance Examinations and each national university and examination locations in order to maintain contact. Instructions from the center inquiries about examination papers or any correction of errors in a question are performed through the facsimile network so that all examination places are under exactly the same conditions.

Instructions from the Center are sent to 91 national universities, from where they are sent on to each examination location in that district (total:279).The characteristics which make the facsimile particularly applicable to the Joint Achievement Examination are its speed and its large-scale use. This is one of various uses of facsimiles in education.

6.3 Facsimile for Contacts on University Campuses

To date, facsimiles have usually been used in business where documents are sent between offices though telephone lines. However, one unique example of facsimile application exists on the university campus. The Tokyo Institute of Technology has developed Optical Network System to make the exchange of information and various contacts smoother between two campuses situated a long distance apart. The facsimiles installed in the advisory rooms of both campuses play an important role in CIONS. Information such as graphics or drawings can be exchanged directly between these rooms.

6.4 Use of Facsimiles in Private Schools for Supplemental Study

The number of primary and junior high school students in Japan who go to evening private schools for supplemental study is large. According to research conducted by the Tokyo Metropolitan Government in November 1981, 26% of public primary school students and 53% of public junior high school students attended these evening classes.

There are many types of these private schools throughout the country. Among them, correspondence private schools use facsimiles have recently appeared. A rental facsimile is placed in a subscriber's home and is connected to the one in the private school through telephone lines. Answers to questions, the correction of papers and even twice a week counseling for studies are handled through these machines.

It has previously been difficult for a pupil to obtain a quick response from a teacher because of the length of time required by post. This problem is solved by using the facsimile and the correspondence teaching system is more effective. It is anticipated that correspondence private schools will become more popular if they are well received and facsimile installation cost is reduced.

7. VIDEOTEX (CAPTAIN SYSTEM)

7.1 Organization

In Japan the two-way visual information system, VideoTex, which displays visual information through conventional telephone lines, is called the CAPTAIN (Character And Pattern Telephone Access Information Network) system. Since the MPT announced the project in April 1978, it has cooperated with NTT in the development and experimentation of the system. In February 1979 the CAPTAIN System Laboratory was established and in April 1980, the IP(Information Provider) Association was set up in which any provider of information such as newspaper companies, TV or radio broadcasting companies may participate.

The first phase of experimental service with 2,000 subscriber terminals in the Tokyo area began in December 1979 and lasted till March 1981. Then in 1983 actual field tests began in Mitaka City near Tokyo. The CAPTAIN Service Co., capitalized at ¥300 million (US$ 1.30 million), was established in February 1984 and will start commercial business activity from April. Actual service is planned to begin in November 1984.

7.2 System

The CAPTAIN system utilizes conventional telephone lines for transmitting a large quantity of visual information and displays this on a TV screen. The system applies the "Pattern Transmitting Method" for its visual coding. In order to display many complex KANJI in Japan, this method in which characters are transferred into dot patterns and then transmitted from the Master center to subscriber terminals is considered most suitable. Compared with the "Code Transmitting Method", the Pattern Transmitting Method has an advantage of permitted ratio over errors while transmitting. However, the transmitting speed of displayed frames is rather slow. The number of displayed pixels of a frame is divided into 248(H) x 204(V) dots; a standard character is displayed by 15 x 18 dots. Thus the quality of picture frames is coarser than a conventional TV screen.

The number of terminals of CAPTAIN System as of end of September, 1985 is shown in Table 7-1.

Table 7-1: NUMBER OF TERMINALS (SEPT. 30. 1985)

Region	Home	Business	Total
Tokyo	508	3,252	3,760
Kanto	109	927	1,036
Nagoya	45	463	508
Osaka/Kyoto	221	1,639	1,860
Shinetsu	4	165	169
Hokuriku	11	160	171
Kyusyu	45	371	416
Hokkaido	1	53	54
Others	-	49	49
Total	944	7,079	8,023

7.3 Information Content

From the data of information input to the CAPTAIN system as of the February 1984, 13.1% of the total of stored display frames is related to education/learning and cultural usage. Although this percentage is rather high, updated display frames since June 1981 are not large. This might be because of the low utilization rate for education, and this will be discussed later in the evaluation of the system.

7.4 Evaluation of the CAPTAIN System

A questionnaire and interview was made on monitors on the home use of the system in Tokyo.

Table 7-2 : Rate of Educational Use from the Viewpoint of Utilization

	Husbands	Wives	Children
Learning	0.7	0.4	0.4
Practical knowledge	28.2	12.0	2.9
Practical information for daily life	23.7	28.0	11.6
Amusements/Hobbies	7.3	6.0	37.2
Others	40.1	53.6	47.9

The utilization rate for educational use is thus shown to be quite low compared with the other categories for at present. The next table shows which information utilized by monitors was thought to be useful.

Table 7-3 shows the top-ten ranking of valuable information for which subscribers are willing to pay, as well as the average information charges per period of viewing. For example, correspondence courses, which have an average information charge of ¥11.9, is ranked at the top. This shows that there are many people who are willing to pay reasonable charges, especially for information of educational value.

Table 7-3 : Top-ten Ranking of Valuable Information for which Subscribers are Willing to Pay

Order	Information Category	Percentage (%)	Average Charge(¥)
1	Correspondence courses	35.2	11.9
2	Medical organization/knowledge	46.1	9.0
3	Self-study books for primary school/junior high school	29.9	8.3
4	Encyclopedias/dictionaries	52.7	8.3
5	Guides for entrance/trial exams, school guidance	32.3	7.7
6	Reservations for airplanes/train	49.2	7.1
7	Traffic information/airplane or train timetables	42.9	6.8
8	Stock quotations/exchange rates	24.5	6.7
9	Real estate information	26.6	6.4
10	Practical knowledge for daily living	39.6	6.2

As a result of this survey, the utilization rate of educational use is shown not to be so high as other categories such as hobbies; however, from the point of view of the charges, there are many people willing to pay for the educational use of the system. Thus the educational use of the CAPTAIN system has great potential to grow into a huge market in future.

7.5 Introduction of the CAPTAIN System to Primary Schools

The following unique examples show actual uses of the CAPTAIN system in primary schools. Two schools, Omori Daiichi and Yukigaya, introduced terminals of the system to their classrooms.

Thirty to forty-five frames of the CAPTAIN programs are used for each subject shown. The teachers explain the subjects with the displayed contents of the program which are transmitted from the master center to the terminals installed in the classrooms. For the time being, the system does not have an actual voice output explanation. Though the teachers must personally explain, it is quite an effective teaching method for the pupils. The display-speed of the system is recognized as being rather slow, but it seems adequate for pupils in primary schools and there is now practically no problem in the manner of use.

8. INS

8.1 General Description

The INS (Information Network System) project, announced by NTT with a 20 year time span and a 30 trillion yen (US$ 130 billion) investment, is aimed at establishing an information-infrastructure by stretching a digital communication network across the country - one of the most unusual and ambitious projects in the world. INS integrates telecommunication systems with computers, where various types of home devices are also realized, in order to make a new complex system in which data, image and voice communication are all integrated. Accordingly, INS plays a very important role in our future information-oriented society, particularly in its educational applications.

There are two main purposes in the INS project:

1. To construct digital networks throughout the country in order to integrate all communication media.
2. To standardize communication charges.

The move towards the INS network offers various communication services including standardization of charges by gradually digitalizing the existing telephone networks. The realization of this huge NTT undertaking will totally change our daily lives in the coming 21st century. INS is truly the core of all new media projects in Japan.

According to NTT reports, INS services related to education are anticipated as follows:

- Long distance lectures and studies at home by means of the video conference system.
- The use of various types of learning programs including English conversation.
- CAI (Computer Assisted Instruction)

8.2 VRS (Video Response System)

The VRS (Video Response System) is a complex information system in which various information stored in the Center will be shown on the screen of a subscriber's TV terminal in the form of still or animated pictures, sometimes with voices, in response to a subscriber's call using a push-button telephone set or specialized keyboard transmitted through broad band cables.

8.3 INS Model System

NTT began constructing a model system in the Musashino-Mitaka area, a suburb of Tokyo, in September 1982. Experimental services are planned to began in June 1984 and will cover the following categories:

> Digital telephones, digital visual communication, digital still picture services,ultraspeedfacsimiles,andvideo conference services.

The original number of subscribers for this model system was to be 300. However, 2,568 persons applied, so NTT increased the number to 450, and accepted a total of 1,990 subscribers under a 6 month rotation plan. This is an indication of the great interest people have in this kind of future system in Japan.

The same may be said of IPs. As of the October 1983 deadline for applications, 322 companies had applied for these categories:

-Digital still picture services	241
-VRS	224
-Digital facsimiles	68
-Voice stored services	48
-Multi-media data base access services	52

(Note: some cover more than two categories)

Recognizing the potential value to education, the NHK model offer programs for home-study and other education-related information. Several publishers will provide information on publications, learning programs or simulation programs realized with animated pictures. Private schools for supplemental studies are planning to provide two-way interactive learning systems, various learning materials, entrance examination schedules, job information, and counselings on study planning, etc..

9. LONG DISTANCE LECTURES

Many universities have not just one but two or more separate campuses, and students, professors and clerical personnel have to shuttle between them to attend classes, give lectures and attend conferences. This is both a waste of time and a psychological burden for them. Moreover, when making a schedule for lectures and faculty meetings, the time required to cover the distance between the two locations must be considered.

One excellent solution to this problem might be to broadcast lectures electronically from one location to another, thereby making it unnecessary for students and instructors to shuttle between separate campuses. In the United States, ITFS (Instructional Television Fixed Service) is authorized to use the microwave frequency (2,500-2,690MHz) for educational purposes. Ten universities including Stanford University use ITFS broadcasts for students on nearby campuses and at industrial firms. Students and company employees who attend these telecast lectures can get credits. At present, Japan has no such broadcasting frequency band for educational purposes at universities.

9.1 Slow Scanning TV System

The telephone is a typical personal communication medium and is nowadays indispensable in daily life or business activities. Transferring lectures through the telephone has great advantages economically. One such telephone-lecture system has been developed by the Tokyo Institute of Technology using 3 telephone lines. The system utilizes handwriting transmission as well as TV still picture transmission equipment. Although it does not function like an ordinary TV relay, the system approximates the classroom style where a lecturer uses a blackboard or OHP.

9.2 Video Memory System

In usual university lectures in Japan, a wide blackboard is divided into several parts for the lecture's use, and students are assisted in their understanding of the lecture by comparing the writing on each part. To simulate this situation, the blackboard is divided into 3 parts which are caught by 3 video cameras and the writing on each part is transmitted in a parallel fashion, and then displayed on 3 TV monitors. Although this might be quite an effective way to handle lecture transmission, signals of three channels to transmit one lecture will become very large and the expense will be enormous if transmission distance becomes longer. To decrease this expense, the Tokyo Institute of Technology has developed a system in which the 3 multi-patterns can be transmitted using one channel line and a video memory.

NTT has developed this same type of system and now is experimenting with lecture transmission between its Musashino Electrical Communication laboratory and its Yokosuka laboratory, where writings on the blackboard or desk are shot by several cameras and transmitted to the receiving laboratory, then displayed on several monitors using the above video memory as if several transmission trunk lines were operating.

9.3 Optical Fiber System

When the Tokyo Institute of Technology founded a new graduate school in the Nagatsuta district of Yokohama, the distance of 20 kilometers from the main campus posed a problem. In 1982 the two campuses were connected by an optical fiber cable system to transmit lectures.

The system is designed to meet the needs of teachers wishing to use teaching aids other than the blackboard. It is assumed that such teachers are fairly familiar with the operation of switches. Once the "lecture" button has been pressed as usual, other suitable buttons can be switched on as needed. For example, a teacher wishing to use an OHP (there are two) needs only to push the "OHP" button before a lecture. In order to explain by way of drawing from a textbook, the teacher pushes the "presentation" button and places the textbook at a designated place on the desk. A closeup of the drawing is then projected on one of the video screens in each lecture room. The video camera is adjusted automatically to project the teacher in large size on the remaining screen in Room "a." Slides and video tapes may be used simultaneously with this operation.Thus an instructor, using a blackboard or other teaching aids, can deliver his lecture over a long distance through the simple operation of buttons. The system is so designed that a lecture given in Room "a" can be transmitted to Room "A" just as effectively as a lecture in Room "A" can be transmitted to Room "a."

For an overall evaluation of the system, the following question was put to students: Supposing that a lecture given at Nagatsuta is transmitted to O-okayama under the system, which place would you choose to attend the lecture? (It takes about two hours to go to Nagatsuta and return to O-okayama).Of the 62 students, all but one replied that they would prefer to attend the lecture at O-okayama. Obviously, traveling for two hours to attend a lecture on a separate campus is no small burden for students in Japan.

10. COMPUTER

10.1 Microcomputer in Schools

The microcomputer (or personal computer) has recently drastically increased in capacity and decreased in cost. Because of this, computer applied devices in almost all categories have been developed and put into use. Microcomputers are now utilized in education, particularly for educational research or in the classroom. Let us take a look at the current status of microcomputer application in education.

Table 10-1 : State of microcomputer installation in schools*

Type of school		Number of schools installed	Total number of schools	Rate of installation	Average units installed/school
Primary	Public	27	24,802	0.1 (%)	1.1
	Private	9	168	5.4	2.4
	Total	36	24,970	0.58	1.78
Junior High	Public	94	10,252	0,9	1.3
	Private	100	550	18.2	3.1
	Total	194	10,802	3.09	1.37
Senior High	Public	1,970	3,954	49.8	3.9
	Private	400	1,242	32.2	4.8
	Total	2,370	5,196	56.38	4.2

*Ministry of Education research results, January 1983

As shown, almost 50% of the public senior high schools and 30% of the private high schools have installed microcomputers. However, the installation rate at public primary schools is only 0.1%. In the case of junior high schools, 0.9% of the public and 18.2% of the private schools have microcomputers, an average of one computer for every 50 schools. Though the average number installed per high school is 4.2, 70% of the total have installed less than 3 computers. Accordingly, the introduction of microcomputers to schools in Japan is not yet deeply rooted, with a few exceptions.

Table 10-2 : Microcomputer utilization in schools

Type of school		CAI	CMI	Computer Education	Club activities	Number of schools installed
Primary	Public	23(85.2%)	6(22.2%)	0(0.0%)	15(55.6)	27
	Private	2(22.2)	8(88.9)	0(0.0)	2(22.2)	9
	Total	25(69.4)	14(38.9)	0(0.0)	17(47.2)	36
Junior High	Public	31(33.0)	60(63.8)	2(2.1)	32(34.0)	94
	Private	18(18.0)	76(76.0)	2(2.0)	31(31.0)	100
	Total	49(25.3)	136(70.1)	4(2.1)	63(32.5)	194
Senior High	Public	688(34.9)	1209(61.4)	318(16.1)	766(38.9)	1970
	Private	131(32.8)	294(73.5)	59(14.8)	111(27.8)	400
	Total	819(34.6)	1503(63.4)	377(15.9)	877(37.0)	2370

CMI (Computer Managed Instruction) is seen to enjoy the highest percentage of use, followed by CAI (Computer Assisted Instruction) and use in club activities. In primary schools, CAI is the most utilized category. However, in this case, only a part of the CAI potential is utilized, such as for variation in classroom audio-visual lessons. CMI is utilized in transactions concerning pupils' records, health data, etc..

10.2 Microprocessor

The microprocessor, with its function to control arithmetic calculation, is a tiny LSI chip, and is recognized as the core of the computer. Micro-electronics diffusion is gradually penetrating the educational category and is being applied to teaching materials and tools. The most useful results to date have been attained in education for the handicapped.

The Tokyo Institute of Technology constructed a 'Light-push button box' in 1980. Self-lighted push buttons are arranged on the box and can be pushed in order by children corresponding to different programs, thereby obtaining data related to the state of a child's development. Micro-electronics technology is thus providing a useful means of developing teaching materials and tools in Japan.

10.3 Computer Network

Large computer centers were established in 8 national Japanese universities in order to perform advanced scientific calculations. These computers had previously been used independently; however, with this 1981 packet-exchange data communication network, "DDX"., (the international packet communication network, VENUS-P, also started in Japan), the university network, N-1, connects not only the above centers but also other computers installed in universities throughout the country.

At present, large computers for common use are installed in 8 universities (Hokkaido, Tohoku, Tokyo, Nagoya, Kyoto, Osaka and Kyushu universities and the Tokyo Institute of Technology). These computers can be accessed from the 3,000 terminals connected to the network. Accordingly, the data-bases originally constructed by each university independently are now available to all universities for common use.

10.4 VAN (Value Added Network)

VAN (Value Added Network) is an on-line data processing service using special telephone lines permitted by the public telecommunications company. The present law, however, states that use of data communication lines between enterprises is basically not allowed. Only NTT can offer its data communication lines for related services, with very limited exceptions. Due to the recent rapid progress in telecommunications, particularly that related to data processing, reorganization of the NTT structure toward a new type of private firm and an open market policy for use of data communication lines is now under way. The VAN project will change our daily lives, as services such as electronic mailing, video conferences and data provision are planned. These are already under experimentation in the INS project by NTT and many other private firms.

VAN will bring great changes to education. As mentioned earlier, there are many private schools for supplemental studies in Japan, especially for those who wish to enter a university. These schools offer many trial tests and evaluate the possibility of a student's success on the actual entrance examination. The Yoyogi Seminar, one of these schools, started experimental use of the On-line Personal Academic Search System, in which high schools throughout the country and a data base consisting of various information related to the entrance exams are on-line connected. In this system examinees are able to receive their records, university information, etc. from personal computers installed in the high schools. Although the word "Juken-Senso" meaning "examination war" is often used, a new word, "Jyoho-Senso", "war of information" has recently appeared.

10.5 CAI/LAN (Computer Assisted Instruction / Local Area Network)

The tendency for group-study in this country has its roots in history, and the individual approach has arisen only recently. Together with the complex KANJI characters, this has been an obstacle to the diffusion of the CAI system.However, recently, a new type of study method based on individual progress has begun to spread, especially in the private schools for supplemental studies. This increases the number of CAI software production items necessary for personal computer systems. For example, in the private college, Tanaka-Chiyo Gakuen, 40 personal computers are networked with 1M-bit/sec. data transmission speed to be used for CAI.

Software plays the most important role in CAI. However, it is quite difficult to write CAI software for teachers who are not computer programmers. At present, ready-made software is most commonly used. However, with the popularization of the CAI system, an easier way of producing software for both trained programmers and non-trained teachers is required.

11. PROSPECTS FOR THE FUTURE

In this short report, we have discussed advanced communication technology as it relates to education. Each chapt

In this short report, we have discussed advanced communication technology as it relates to education. Each chapter has shown that the number of communication technology systems used in education is quite high in Japan. With the rapid development of new technology, new systems and devices are expected to be introduced to the educational field to provide even more effective educational methods. However, the use of such new technology in education should be considered in depth during the first stage of its introduction.

A typical question often posed by individuals coming to observe the long-distance optical communication lecture system in Tokyo Institute of Technology is :

If such a system is developed further, won't we be able to just sit at home and take notes on the lectures?

Technically, it will be possible to construct a new type of education covered by many nice catch-phrases such as "lessons without classrooms" or "universities without campuses". However, the question arises: What is real education for us? Although the development of communication technology makes it possible to participate in lectures without using our legs, it does not heighten our will to study.

Here is one future possibility:

> A professor has recorded his lecture onto a tape and asked his assistant to bring it to the lecture room to play it back. The students also begin to bring in tape recorders to record the lecture. Finally, only tape recorders are left in the room.

If we participate in a lecture at home, we might use the VTR to record it or many of us might even forget to turn it on. Our individual will to study would be the main determining factor.

There are not only lectures for students to participate in but also many other things to learn on campuses, especially from the viewpoint of human relations. Thus the long distance lecture system is limited to only graduate classes in Tokyo Institute of Technology. Although some may doubt that the graduate student's will to study is higher than the undergraduate's, in most cases it has been shown to be so.

It is important to determine the limitations of communication technology and to use it effectively for students. As many chapters point out, we are now living in an advanced information-oriented society where we are being drawn into the whirlpool of excess information. Though the amount of information is increasing annually, the ratio of usable information for individuals is rapidly decreasing. In such a society, persons with certain abilities are in demand:

- ability to independently locate useful information
- ability to retrieve needed information
- ability to arrange collected information in a presentable manner

The most important theme in the educational use of communication technology is how to raise individuals who have the energy and the will in a contemporary information-oriented society. By educating such persons, communication technology will assume its important position in the educational world.

Chapter VI

RECOMMENDATIONS

1. UNESCO APEID and member countries which already have access to technologies should see to it that individual countries be enabled to develop their own capability to develop software ; otherwise, there may be serious limitations regarding the use of imported softwares.

2. The importance of establishing national resource centers for facility provision, information exchange and research in advanced educational technology, and the promotion of regional cooperation between these centers deserve immediate attention of educational authorities.

3. Programs in educational technology should be included in teacher education in various forms, e.g. institutionalized separate compulsory / elective courses to pre-service trainees, providing in-service teachers with short / long term programs. Different types of groups need to be identified and courses need to be designed to meet needs.

4. Collaborative development and sharing of software and teaching-learning materials among individual professionals and institutions on regional and or national levels should be encouraged in order to maximize

the effect of efforts being made in educational technology. Follow-up activities on the exchange of softwares and other audio-visual materials should be organized.

5. The participants of the seminar should take action that the results of the seminar will be reflected more effectively in education of each country.

6. It is recommended that all the previous participants in the Asian Seminar on Educational Technology in Tokyo should set up a network to insure continuity of efforts.

7. The Fourth Asian Seminar on Educational Technology has made positive contribution to promotion of educational technology. The seminar should go on for further exchange of ideas and promotion of educational technology.

8. The Fourth Asian Seminar held in Tokyo highlighted the importance of educational software development and the indigenous capability of software development in the region.

There is a view to review the state of affairs in these aspects. This may be considered to be the topic for the next seminar.

APPENDIX I.

GREETING

1. Greeting by Mr.Tahara

Mr. Akiyuki Tahara
Director of Educational
and CulturalExchange Division,
Ministry of Education, Science and Culture

Ladies and Gentlemen,

It is my great pleasure to address at the Opening Session of the Fourth Asian Seminar on Educational Technology. On behalf of the Ministry of Education, Science and Culture, and also of the Japanese National Commission for Unesco, I should like to extend my welcome to all the participants from countries in Asia and the Pacific region.

This Seminar is a part of the Japanese contribution to the APEID activities. As you know, the Asian Programme of Educational Innovation for Development is being promoted jointly by 25 member countries of Unesco in Asia and the Pacific region. Its countribution to the promotion of endogenous development of education is highly appreciated not only in this region but also in other regions. All the countries in the region are seeking a way to develop the education while preserving own values of their societies. The principles of mutual learning and mutual assistance based upon equality and self reliance should therefore be laid in the foundation for the regional cooperation. We fully share this idea and wish to contribute to the common efforts.

For this purpose, Japan has been cooperating positively in APEID activities since its establishment in 1974. In these years, Japan has been participating in the five programme areas of APEID such as (1) Educational Technology, (2) Vocational and Technical Education, (3) Curriculum Development,(4) Science Education, and (5) Special Education in the form of organizing seminars, workshops and providing financial contribution for the implementation of mobil teams.

Through these activities, some results are obtained. For example, Unesco Regional Office for Education in Asia and the Pacific published "Computers in Education-An outline of country experiences" in 1985. This publication is based on the final report of the Third Asian Seminar on Educational Technology, which was held in Tokyo, 1984.

I am convinced that the theme of the utilization of advanced technologies promoting the teacher education discussed in this Seminar will be useful for all participating countries.

I would like to mention that Tokyo Gakugei University which kindly actually hosted this Seminar enjoys high appreciation as one of the best institutions to conduct the instruction and research in this paticular field in Japan.

I hope that all participants will obtain some invaluable experience and information, through exchange of views and ideas and the cooperative relationship among the countries will be further strenghtened through this Seminar.

In concluding my address, I wish to express my sincere thanks and gratitude to Dr.Abe, President of Tokyo Gakugei University, his colleagues as well as Professor Nishinosono, who is the chairman of Japan Council of Educational Technology Centers, who have made great efforts in organizing this Seminar.

I shall conclude my brief statement by hoping that you will enjoy beautiful scenery of Japanese autumn as well.

Thank you

2. Greeting by Prof. Nishinosono

Prof. Haruo Nishinosono
Chairman,
Japan Council of Educational Technology Centres

Mr. Tahara, Director, Education and Cultural Division Ministry of Education, Science and Culture, Mr. Ueno, Secretary General of Tokyo Gakugei University, Distinguished participants from the Asia and the Pacific. Ladies and Gentlemen,

On behalf of the Japan Council of Educational Technology Centres and on my own personal behalf, I feel very pleased in extending to you a warm welcome to the Fourth Seminar of Educational Technology convened as a part of the Third cycle of the Asian programme of Educational Innovation for Development. I should like to take this opportunity to express our profound gratitude to all the persons concernd in the Ministry of Education, Science and Culture, We are very grateful to Tokyo Gakugei University for your support and encouragement given to us.

As all of you know well, this is the fourth seminar of the third cycle of the APEID programme. In this cycle, a variety of activities are included, such as the universalization of primary education, education for promotion of scientific and technological competence and creativity, education and work, education and rural development, professional support services and training of educational personnel, co-operative studies, reflection on and research related to future development and so on, Among these activities, educational technology is considered an infrastructure for promoting other activities. We have done our best to plan this seminar in line with the spirit of APEID.

In this seminar, we shall focus our topics on the problem of improving teacher education by using new technologies. We have arranged visits to several leading institutions where the new technologies are being applied to improve our education, especially teacher education in Japan. We would deeply appreciate to have your comments on our efforts and to exchange our opinion with you. During this seminar, we shall share our experiences and discuss the problems we face to in different countries. I am quite sure that active discussions will emerge and promising idea will be suggested in the sessions.

At the end of my words, I deeply hope you will find time to enjoy our cultural heritage in spite of your short stay in Japan.

Thankyouverymuch foryour kind attention.

Appendix 2.

SCHEDULE AND AGENDA

Accommodation in Tokyo: Hotel Sun Route Tokyo
3-1, Yoyogi 2-chome, Shibuya-ku,
Tokyo
Telephone: Tokyo (03) 375-3211

Accommodation in Kyoto: Hotel Alpha Kyoto
Sanjo-Agaru, Kawaramachi-3joh
Kyoto-shi, Kyoto
Telephone: Kyoto (075) 241-2000

Thursday 10 Oct.

	Arrive at the New Tokyo International Airport and Hotel Sun Route Tokyo
19:00-20:30	Registration of Participants and Briefing on the Seminar by the Secretariat at the Room "Kiri-no-ma", 3rd floor, in the Hotel Sun Route Tokyo

Friday 11 Oct.

8:45	Leave for Tokyo Gakugei University
10:00-10:30	Opening Ceremony of the Seminar
10:35-10:55	Tea Break
10:55-11:05	Election of Officials and Adoption of

	the Agenda
11:05-11:55	* Plenary Session (I) Country Report from Participating Country (Australia)
11:55-13:15	Lunch
13:15-14:45	* Plenary Session (II) Country Reports (Korea, Malaysia)
14:45-15:00	Tea Break
15:00-16:30	* Plenary Session (III) Country Reports (Thailand, India)
16:30	Leave for the Hotel

Saturday 12 Oct.

8:30	Leave for Tokyo Gakugei University
9:40-10:40	* Plenary Session (IV) Country Report (Philippines)
10:40-11:00	Tea Break
11:00-12:40	* Plenary Session (V) Introductory Talk with Discussion by Professor Y.Shimizu
12:40-13:30	Lunch
13:30	Leave for the Hotel

16:00	Leave the Hotel for Tokyo station by Japan National Railway (JNR)
17:00	Leave forKyoto by Shinkansen "HIKARI" No.29
19:51	Arrive at Kyoto

Sunday 13 Oct.

(Morning)	Study visit to Kyoto Municipal Science Centre for Youth
(Afternoon)	(Free)

Monday 14 Oct.

8:30	Leave for Kyoto University of Education
9:00-15:30	Study visit to the University
16:26	Leave for Tokyo by Shinkansen "HIKARI" No.8
19:16	Arrive at Tokyo

Tuesday 15 Oct.

8:30	Leave for Tokyo Gakugei University
9:30-11:20	* Plenary Sessions (VI) Discussion for the Summary of the

	Country Reports
11:20-11:30	Tea Break
11:30-11:50	Demonstration by Prof. Y. Murakami
11:50-13:00	Lunch
14:00-16:30	Study visit to Ooizumi Campus of Tokyo Gakugei University
16:30	Leave for the Hotel

Wednesday 16 Oct.

8:30	Leave for Institute and University in Chiba Prefecture.
10:30-12:00	Study visit to National Institute of Multi Media Education
12:00-13:00	Lunch
13:00-14:30	Study visit to University of the Air
14:30	Leave for the Hotel
18:30-20:30	Reception by Prof. Haruo Nishinosono, Chairman of the Japan Council of Educational Technology Centres, at the Room "Bara-no-ma" in the Hotel Sun Route Tokyo

Thursday 17 Oct.

8:30	Leave for Tokyo Gakugei University
9:30-9:50	* Plenary Sessions (VII) Discussion for the Final Draft Report (FDR)
9:50-11:20	Group Discussion (3 Groups)
11:20-11:30	Tea Break
11:30-12:35	* Plenary Sessions (VIII) Discussion for the FDR
12:35-13:45	Lunch
13:45-16:00	* Plenary Sessions (IX) Discussion for the FDR
16:00	Leave for the Hotel

Friday 18 Oct.

8:30	Leave for Tokyo Gakugei University
9:30-12:00	Study visit to Tokyo Gakugei University
12:00-13:30	Lunch
13:30-14:00	Demonstration by Prof. M. Kitamura
14:00-15:40	* Plenary Session (X)
15:40-16:00	Tea break

16:00-16:45	* Plenary Session (XI)
16:45	Leave for the Hotel

Saturday 19 Oct.

8:30	Leave for Tokyo Gakugei University
9:30-11:00	* Plenary Session (XII)
11:00-11:15	Tea Break
11:15-11:45	* Plenary Session (XIII) Adoption of the FDR
11:45-12:00	Closing Ceremony
12:00-13:00	Lunch
13:00	Leave for the Hotel

Appendix.3

List of Participants and Observers

Australia

Mr. Wayne Ransley
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Hobart
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Australia

India

Mr. A. K. Jalaluddin
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National Council of Educational Research and Training
New Delhi - 110016
India

Republic of Korea

Mr. Sohn Byeong-Gil
Researcher
Korean Educational Development Institute
Seoul
Republic of Korea

Malaysia

Mr. Abdul Aziz bin Mohd. Sultan
Assistant Director (Curriculum)
Teacher Education Division
Ministry of Education
Malaysia

Philippines

Mr. Nilo L. Rosas
Assistant Director
Bureau of Higher Education

Ministry of Education, Culture and Sports
Manila,
Philippines

Thailand

Mr. Thamrong Chotamongsa
Director of North Bangkok Campus
Institute of Technology and Vocational Education
North Bangkok Campus
Bangkok,
Thailand

Japan

Mr. Masayoshi Akahori
Associate Professor
National Institute of Multi Media Education
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Mr. Keiji Fujita
Professor
National Institute of Multi Media Education
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APPENDIX 4.

ORGANIZING COMMITTEE

Unesco and International Affairs Department,

Science and International Affairs Bureau,

Ministry of Education, Science and Culture

Mr. Hiroshi Ueki
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Science and International Affairs Bureau

Mr. Gakuji Shigetou
Deputy Director-General,
Science and International Affairs Bureau

Mr. Nobuo Nishizaki
Deputy Director-General,
Science and International Affairs Bureau

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Educational and Cultural Exchange Division

Mr. Hiroshi Nirasawa
Deputy Director,
Educational and Cultural Exchange Division

Mr. Kazuro Iida
Chief,
Educational and Cultural Exchange Division

Mr. Takao Iizawa
Seminer staff,
Educational and Cultural Exchange Division

Japan Council of Educational Technology Centres

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Council of National University Centres for Educational Technology
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